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UNITED STATES DEPARTMENT OF AGRICULTURE

BULLETIN No. 485

Joint Contribution from the Bureau of Plant Industry, WM. A. TAYLOR, Chief
and the Bureau of Crop Estimates, L. M. ESTABROOK, Chief

Washington, D. C. January 20, 1917

APPLES: PRODUCTION ESTIMATES AND IMPORTANT COMMERCIAL DISTRICTS AND VARIETIES

By

H. P. GOULD, Bureau of Plant Industry, and
FRANK ANDREWS, Bureau of Crop Estimates

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STATISTICAL ESTIMATES OF VARIETIES.

From a study made in 1910 of nursery catalogues issued for that year it appeared that the nurserymen of the United States were then offering to the trade trees of at least 500 different varieties of apples. It is to be assumed there was some demand for most of the varieties catalogued, otherwise there would have been no inducement to propagate them. The number of varieties offered for sale at the present time is doubtless somewhat less than it was in 1910, as there is a tendency to decrease rather than to increase it, but the decrease is not very rapid.

Note.—This bulletin is of general interest to those concerned with the apple industry. The information which it contains in regard to the areas where apples are grown extensively and the principal varieties produced in them is based largely on reports received from correspondents who were requested to supply such information and who were addressed in this connection because of their familiarity with the fruit interests in the States in which they live. All diagrams and figures showing estimates, except as noted, have been contributed by the Bureau of Crop Estimates.

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However, the number of varieties that are produced in large quantities is relatively small. This is shown in figure 1, where each bar represents the estimated average relative proportion of the variety indicated in the crops for 1909 to 1913, inclusive. The proportions are shown also in Table I in barrels and percentages. The total yield is based on the report of the Thirteenth Census (for 1909) and upon the reports of crop correspondents of the Bureau of Crop Estimates.

TABLE I.—*Estimated average production of 35 of the most important varieties of apples, showing the percentage relation of each variety to the entire crop, for the years 1909 to 1913, inclusive.*

Variety.	Production.	Relation to total crop.	Variety.	Production.	Relation to total crop.
	Barrels.	*Per ct.*		*Barrels.*	*Per ct.*
White Pearmain (*White Winter Pearmain*)	269,000	0.5	Fall Pippin	988,000	1.7
Arkansas (*Mammoth Black Twig*)	393,000	.7	Oldenburg (*Duchess of Oldenburg*)	1,097,000	1.9
Missouri (*Missouri Pippin*)	499,000	.8	Red Astrachan	1,120,000	1.9
Wolf River	503,000	.9	Maiden Blush	1,203,000	2.0
Arkansas Black	526,000	.9	York Imperial (*Johnson Fine Winter*)	1,262,000	2.1
McIntosh (*McIntosh Red*)	530,000	.9	Grimes (*Grimes Golden*)	1,294,000	2.2
Horse (*Yellow Horse*)	545,000	.9	Wealthy	1,322,000	2.2
Northwestern	553,000	.9	Early Harvest (*Prince's Harvest*)	1,641,000	2.8
Tolman (*Talman Sweet*)	592,000	1.0	Rome Beauty	1,813,000	3.1
Gravenstein	619,000	1.1	Jonathan	2,135,000	3.6
Fameuse (*Snow*)	775,000	1.3	Rhode Island Greening (*Greening*)	2,767,000	4.7
Tompkins King (*King of Tompkins County*)	797,000	1.4	Winesap	3,012,000	5.1
Golden Russet	830,000	1.4	Northern Spy	3,570,000	6.1
Yellow Bellflower	845,000	1.4	Ben Davis	7,833,000	13.3
Yellow Transparent	893,000	1.5	Baldwin	7,861,000	13.4
Stayman Winesap	907,000	1.5	Other varieties	6,109,000	10.4
Red June (*Carolina Red June*)	914,000	1.6			
Limbertwig (*Red Limbertwig*)	915,000	1.6			
Gano	927,000	1.6	Total	58,827,000	100
Yellow Newtown (*Albemarle; Newtown Pippin*)	968,000	1.6			

It is to be observed that there are but 35 varieties named in figure 1 and Table I, or only about 7 per cent of the number which doubtless were being planted more or less in different parts of the country during the period covered by these records. These 35 varieties include all those which constituted, as estimated, one-half of 1 per cent (0.5 per cent) or more of the entire crop of the country.

It will be noted also that these 35 varieties constituted nearly 90 per cent of the entire crop, while "other varieties," that is, those not mentioned by name and which doubtless numbered several hundred,[1] comprised but little more than 10 per cent of the whole crop.

The relative number of these varieties which are now prominent is destined to change materially within the next few years. Certain ones in the list, such as Missouri and Limbertwig, have been

[1] This number can not well be determined even approximately, as it doubtless includes varieties growing in the older orchards which are not now propagated by nurserymen.

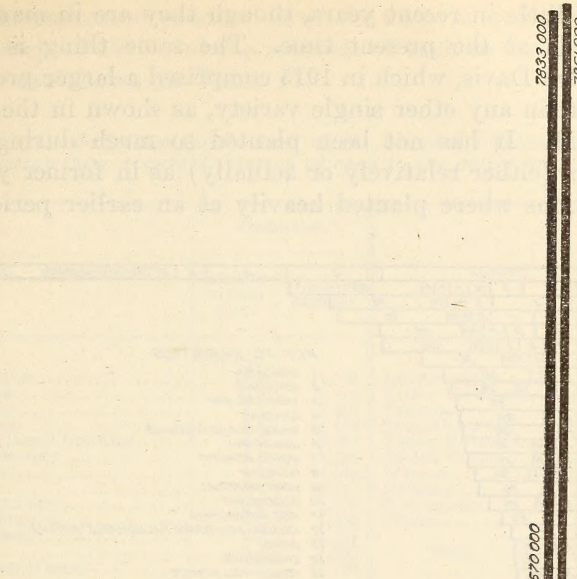


FIG. 1.—Diagram showing the estimated average crop of different apple varieties and the relative proportion of each variety to the entire crop in the United States, for 1909 to 1913, inclusive.

planted but very little in recent years, though they are in many of the older orchards at the present time. The same thing is true in a measure of Ben Davis, which in 1915 comprised a larger proportion of the crop than any other single variety, as shown in the estimates in Table II. It has not been planted so much during the past 5 or 10 years (either relatively or actually) as in former years, and in some sections where planted heavily at an earlier period it

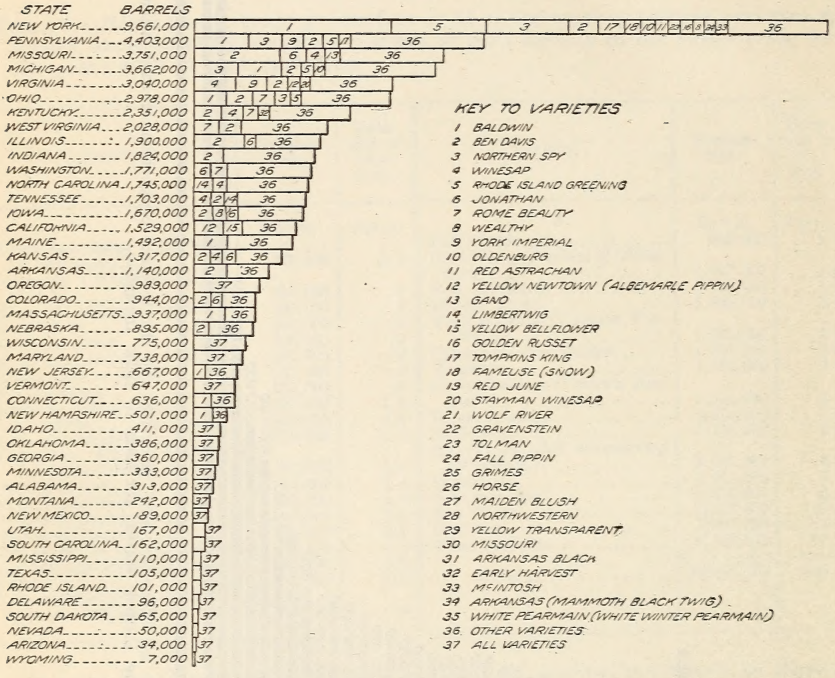


FIG. 2.—Diagram showing the estimated average relative proportion of different apple varieties in the crops of each State for the years 1909 to 1913, inclusive. Several varieties named in the "Key to varieties" are not separately referred to in the diagram. Because of the relatively small quantities in which the omitted varieties are produced in any one State they are included in "Other varieties." These varieties are given in the key, however, in order that the list may include all that are shown in figure 1 and Tables I and III.

has proved unprofitable. The trees therefore have been dug up or worked over to other varieties, or the orchards virtually abandoned.

On the other hand, some varieties, notably Stayman Winesap and McIntosh, have been planted extensively in the younger orchards in some sections. Comparatively few of these trees have reached full bearing age as yet, many in fact not having borne at all. The result of these changes in variety preference will be to modify materially in the future the relative importance of several varieties named in figure 1 and Table I.

The estimated production of the 22 principal sorts that comprised the crop of 1915 and the relation of each to the entire crop for that year are shown in Table II.

TABLE II.—*Estimated production of the 22 most important varieties of apples, showing the percentage relation of each to the entire crop, for the year 1915.*[1]

Variety.	Production.		Variety.	Production.	
	Relation to total crop.	Thousand barrels.[2]		Relation to total crop.	Thousand barrels.[2]
	Per cent.			*Per cent.*	
Ben Davis	14.5	11,100	Limbertwig	2.0	1,511
Baldwin	10.9	8,312	Yellow Newtown	1.7	1,324
Winesap	7.3	5,545	Fameuse	1.3	996
Jonathan	5.9	4,489	Tompkins King	1.3	975
Rhode Island Greening	4.7	3,595	Yellow Bellflower	1.2	939
Rome Beauty	4.6	3,524	Golden Russet	1.2	879
Wealthy	4.3	3,296	Wagener	1.1	822
Grimes	3.8	2,913	McIntosh	1.0	773
Northern Spy	3.8	2,878	Gravenstein	.9	669
York Imperial	3.2	2,456	Others	17.7	13,547
Oldenburg	2.9	2,185			
Gano	2.4	1,852	Total	100	76,350
Stayman Winesap	2.3	1,770			

[1] Monthly Crop Reporter, Apr. 15, 1916, p. 35. The yield is based on the estimates reported in the Thirteenth Census (for 1909) and upon annual reports of crop correspondents of the Bureau of Crop Estimates. About 18 per cent of the crop was classed as summer apples, 25 per cent fall, and 57 per cent winter apples.
[2] The totals do not include 320,000 barrels grown in Rhode Island, South Carolina, and Nevada, where the data were insufficient.

While figure 1 shows the estimated relative importance of the leading varieties on the basis of the quantity of each produced in the country as a whole, figure 2 gives similar information on a State basis and shows the estimated relative importance in quantity produced of the principal varieties in the different States. This figure is also useful as indicating in a general way the geographical distribution of the more important sorts.

The percentages of the different varieties shown in figure 2 are given in Table III and in the supplementary text.[1]

In important apple-producing States not included in Table III the principal varieties and their respective percentages of all apples in a normal crop are:

Kentucky.—Ben Davis, 16.8; Winesap, 14; Rome Beauty, 9.6; Early Harvest, 6.4; Maiden Blush, 4.5; Red June, 4.3; Limbertwig, 4.

Indiana.—Ben Davis, 22.8; Baldwin, 7.2; Grimes, 6.7; Winesap, 6.7; Maiden Blush, 5.8; Rome Beauty, 4.4; Northern Spy, 4.2.

North Carolina.—Limbertwig, 14.3; Winesap, 12.2; Ben Davis, 7.5; Early Harvest, 7.2; Horse, 7.2; Red June, 5.9.

Tennessee.—Winesap, 14.1; Ben Davis, 12.2; Limbertwig, 12.1; Early Harvest, 8.4; Horse, 6.3; Red June, 5.4.

[1] These figures are taken from the Agricultural Outlook, Farmers' Bulletin 641, Nov. 23, 1914, p. 17.

TABLE III.—*Estimated relative production of 35 principal varieties of apples expressed as percentages of a normal crop of all apples.*

Variety.	United States.	Maine.	New York.	Pennsylvania.	Virginia.	West Virginia.	Ohio.	Michigan.	Illinois.	Missouri.	Arkansas.	Washington.	California.
Arkansas	0.7	0.2	.....	0.3	3.1	0.7	0.1	0.0	0.6	1.1	2.3	0.3	0.3
Arkansas Black	.9	.....	.....	.2	.7	.8	.1	.....	.9	1.5	3.0	2.3	1.0
Baldwin	13.4	34.5	31.3	17.8	2.8	5.8	15.6	17.0	2.7	1.5	.4	7.8	3.2
Ben Davis	13.3	9.8	5.0	6.0	11.4	15.7	13.9	8.5	37.8	34.2	44.1	7.4	3.9
Early Harvest	2.8	.9	.9	3.1	4.7	3.9	3.7	1.8	2.2	2.8	2.0	.8	.7
Fall Pippin	1.7	.7	1.7	3.1	1.8	1.5	1.8	1.6	1.1	.4	.7	.8	.6
Fameuse	1.3	3.5	2.4	.6	.1	.0	.6	3.0	1.5	.4	.1	.3	.0
Gano	1.6	.3	.2	.8	.6	1.6	1.3	.3	3.8	6.5	6.6	.8	.2
Golden Russet	1.4	1.7	2.0	2.5	.3	1.6	.9	3.7	.7	.3	.1	.3	.1
Gravenstein	1.1	2.3	.9	1.0	.1	.1	.3	.1	.1	.1	.....	4.1	8.9
Grimes	2.2	.2	.1	2.6	2.6	4.6	5.0	1.2	4.9	3.6	2.1	1.6	.1
Horse	.9	.....	.....	.....	1.0	.0	.0	.0	.2	.5	1.5	.....	.....
Jonathan	3.6	.8	.4	1.4	1.0	1.7	1.8	2.2	9.3	10.4	3.7	13.8	1.7
Limbertwig	1.6	.0	.0	.....	2.5	.8	.3	.0	.6	1.5	5.8	.....	.3
McIntosh	.9	3.7	1.6	.7	.1	.1	.1	.3	.4	.1	.....	.3	.1
Maiden Blush	2.0	.3	1.0	3.0	1.5	2.5	4.5	2.6	2.3	2.8	1.0	.3	.4
Missouri	.8	.0	.0	.0	.2	.1	.1	.1	1.2	3.0	1.4	.5	.9
Northern Spy	6.1	7.1	13.1	11.4	.8	4.2	7.7	17.9	1.4	1.1	.5	3.8	.6
Northwestern	.9	.3	.9	.4	.0	.4	.6	1.9	.3	.3	.....	1.0	.2
Oldenburg	1.9	2.9	2.2	1.1	.1	.5	1.0	5.0	1.7	.5	.....	1.1	.1
Red Astrachan	1.9	3.9	2.1	3.5	.8	2.1	2.7	2.8	.8	.8	.5	1.7	3.3
Red June	1.6	.....	.7	.3	1.8	1.3	.2	.0	1.2	1.9	2.7	1.3	1.4
Rhode Island Greening	4.7	4.1	14.8	5.5	.3	1.4	5.7	5.4	.8	.3	.6	2.2	2.7
Rome Beauty	3.1	.1	.3	2.1	1.2	18.7	10.8	.2	3.8	1.7	1.8	12.2	2.4
Stayman Winesap	1.5	.6	.1	1.8	5.3	1.9	1.3	.1	.5	1.8	1.7	2.7	.9
Tolman	1.0	2.6	2.1	1.1	.1	.4	.5	2.4	.3	.2	.....	.9	.0
Tompkins King	1.4	2.4	4.1	1.5	.0	.5	.6	2.1	.1	.1	.....	2.7	1.1
Wealthy	2.2	5.4	1.8	1.2	.0	1.1	1.2	3.7	1.6	1.3	.1	1.5	.1
White Pearmain	.5	.....	.1	.0	.2	.2	.1	.0	.2	.3	.1	.6	7.5
Winesap	5.1	.5	.1	1.8	20.7	1.8	1.8	.4	5.6	6.8	8.4	7.1	1.4
Wolf River	.9	1.4	.3	.3	.2	.6	.5	1.5	.4	.7	.....	.8	.1
Yellow Bellflower	1.4	1.7	.3	2.3	.2	1.5	1.3	1.2	.5	1.0	.1	1.9	18.6
Yellow Newtown	1.6	.0	.2	.6	7.0	.3	.4	.3	.2	.1	.....	2.9	28.7
Yellow Transparent	1.5	1.1	.3	1.7	1.5	3.2	2.1	1.4	2.1	1.1	.4	1.5	.2
York Imperial	2.1	.....	.1	7.5	15.1	5.0	1.3	.3	.8	1.1	.1	.2	.1
Other varieties	10.4	7.0	8.9	12.8	10.2	13.4	10.1	11.0	7.4	8.2	8.2	12.5	8.2
Number of reports	2,622	55	82	68	57	62	100	122	78	191	42	58	63

Iowa.—Ben Davis, 15.2; Wealthy, 12.4; Jonathan, 10.3; Oldenburg, 8.9; Grimes, 4.9; Northwestern, 4.3.

Kansas.—Ben Davis, 19.4; Winesap, 15.3; Jonathan, 13.8; Missouri, 8.6; Gano, 6; Maiden Blush, 4.3.

Oregon.—Baldwin, 12.6; Yellow Newtown, 11.3; Northern Spy, 7.4; Gravenstein, 7.3; Rome Beauty, 5.6; Tompkins King, 5.1; Ben Davis, 4.9; Jonathan, 4.4.

Colorado.—Ben Davis, 26.3; Jonathan, 18.3; Gano, 7.8; Rome Beauty, 4.8; Winesap, 4.1.

Massachusetts.—Baldwin, 48.4; Rhode Island Greening, 9.3; Gravenstein, 5.7; McIntosh, 5.7; Northern Spy, 5.1.

Nebraska.—Ben Davis, 21.3; Winesap, 13.6; Jonathan, 9.4; Wealthy, 6.2; Oldenburg, 5.8; Grimes, 4.8; Missouri, 4.2; Gano, 4.

Wisconsin.—Oldenburg, 14.7; Wealthy, 13.7; Northwestern, 11.1; Fameuse, 8; Wolf River, 7.5; Ben Davis, 5.1; Golden Russet, 4.2.

Maryland.—Ben Davis, 17; York Imperial, 16.2; Baldwin, 8.8; Winesap, 7.6; Stayman Winesap, 7; Arkansas, 4.4; Early Harvest, 4.2.

New Jersey.—Baldwin, 25.2; Ben Davis, 14.5; Rome Beauty, 5; Early Harvest, 4.7; Rhode Island Greening, 4.3; Northern Spy, 4.2.

Vermont.—Baldwin, 15.1; Rhode Island Greening, 12.8; Northern Spy, 12; Fameuse, 8.1; McIntosh, 6.1; Ben Davis, 5.6; Yellow Bellflower, 4.2.

Connecticut.—Baldwin, 42.2; Rhode Island Greening, 16.9; Golden Russet, 5.2.

New Hampshire.—Baldwin, 51.9; Rhode Island Greening, 5.9; Northern Spy, 5.2; McIntosh, 4.4.

Idaho.—Jonathan, 21.3; Rome Beauty, 16.6; Ben Davis, 13.1; Gano, 7.8; Winesap, 4.6.

TABLE IV.—*Estimated average annual production of 27 leading varieties of apples, by principal States, 1909 to 1913, inclusive.*[1]

Variety and State.	Thousand bushels.
Baldwin:	
New York	9,071
Pennsylvania	2,351
Michigan	1,868
Maine	1,545
Ohio	1,394
Massachusetts	1,360
Connecticut	805
New Hampshire	780
New Jersey	504
Other States	3,905
Total	23,583
Ben Davis:	
Missouri	3,849
Illinois	2,154
Arkansas	1,508
New York	1,449
Indiana	1,248
Ohio	1,242
Kentucky	1,185
Virginia	1,040
West Virginia	955
Michigan	934
Pennsylvania	793
Kansas	766
Iowa	761
Colorado	745
Tennessee	623
Nebraska	572
Other States	3,675
Total	23,499
Northern Spy:	
New York	3,797
Michigan	1,966
Pennsylvania	1,506
Ohio	688
Other States	2,754
Total	10,711
Winesap:	
Virginia	1,888
Kentucky	988
Missouri	765
Tennessee	720
North Carolina	639
Kansas	605
Other States	3,431
Total	9,036
Rhode Island Greening:	
New York	4,289
Pennsylvania	727
Michigan	593
Rhode Island Greening—Continued.	
Ohio	509
Other States	2,182
Total	8,300
Jonathan:	
Missouri	1,170
Washington	733
Kansas	545
Illinois	530
Colorado	518
Iowa	516
Other States	2,393
Total	6,405
Rome Beauty:	
West Virginia	1,138
Ohio	965
Kentucky	677
Washington	648
Other States	2,011
Total	5,439
Wealthy:	
Iowa	621
New York	522
Other States	2,824
Total	3,967
York Imperial:	
Virginia	1,377
Pennsylvania	991
Other States	1,418
Total	3,786
Oldenburg:	
New York	638
Michigan	549
Other States	2,103
Total	3,290
Red Astrachan:	
New York	609
Other States	2,750
Total	3,359
Yellow Newtown:	
California	1,316
Virginia	638
Other States	950
Total	2,904
Gano:	
Missouri	732
Other States	2,048
Total	2,780
Limbertwig:	
North Carolina	749
Tennessee	618
Other States	1,378
Total	2,745
Yellow Bellflower:	
California	853
Other States	1,683
Total	2,536
Golden Russet:	
New York	580
Other States	1,909
Total	2,489
Tompkins King:	
New York	1,188
Other States	1,202
Total	2,390
Fameuse:	
New York	696
Other States	1,629
Total	2,325
Tolman:	
New York	609
Other States	1,167
Total	1,776
Varieties each of which produces less than 500,000 bushels in any one State:	
Early Harvest	4,923
Grimes	3,882
Maiden Blush	3,610
Fall Pippin	2,963
Red June	2,743
Stayman Winesap	2,720
Yellow Transparent	2,679
Gravenstein	1,857
All others	29,776
Total, all varieties	176,473

[1] The Agricultural Outlook, Farmers' Bulletin 641, Nov. 23, 1914, p. 19.

Oklahoma.—Ben Davis, 25.8; Missouri, 12.1; Jonathan, 8.2; Winesap, 8.1; Arkansas Black, 5.6; Gano, 4.

Georgia.—Horse, 14.3; Ben Davis, 12.2; Red June, 10; Limbertwig, 8.8; Winesap, 7.6; Early Harvest, 6.1; Arkansas Black, 4.6.

For 27 of the principal varieties the estimated average number of bushels is shown in Table IV. The principal States of production are also shown where the crop in any one State amounts to at least 500,000 bushels.

The distribution by States of the Baldwin, Ben Davis, Northern Spy, Winesap, and Rhode Island Greening—the five varieties produced in the largest quantities—is visualized in the accompanying

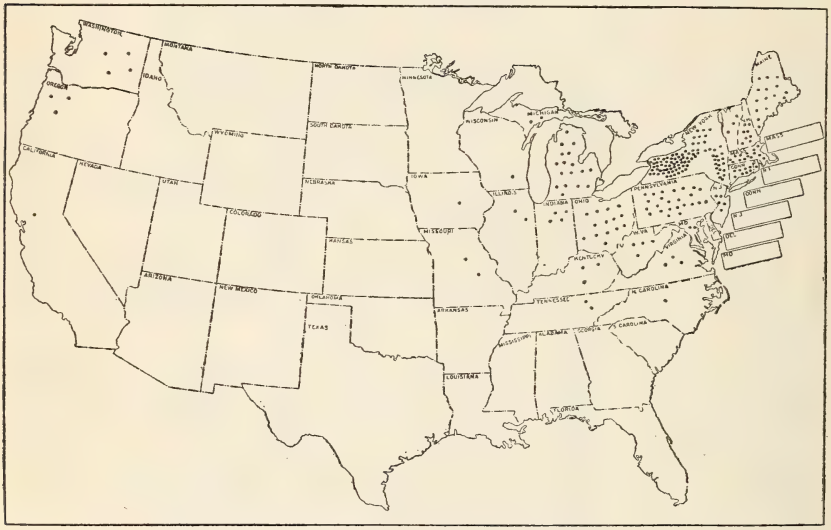


FIG. 3.—Outline map of the United States, showing the distribution by States of the Baldwin apple, each dot representing 100,000 bushels, the total being the estimated average crop for 1909 to 1913, inclusive. The arrangement of the dots within the State boundaries has no significance.

outline maps (figs. 3 to 7). It is to be noted that each dot on the maps represents an estimated annual average crop of 100,000 bushels. In the States, therefore, in which less than that quantity of any one of these varieties is reported no dots are shown on the maps.

IMPORTANT CENTERS OR AREAS OF APPLE PRODUCTION.

The statistical consideration of apple varieties given on the preceding pages presents the best available data regarding the estimated quantity of applies produced in the United States in an average year, and the relative importance of the more prominent varieties. The figures are based on census reports and have to do with the entire crop without distinction between the part grown for commercial pur-

poses and that produced in home or farm orchards. A more detailed survey of the distribution of the apple industry from the production

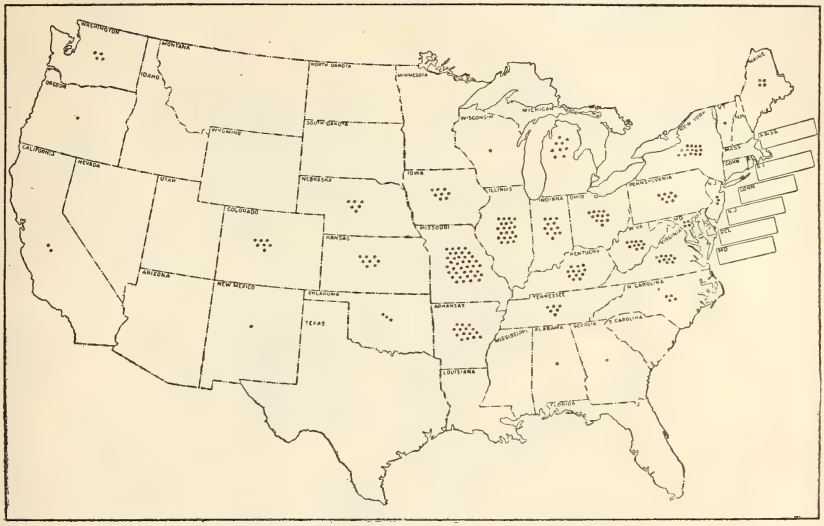


FIG. 4.—Outline map of the United States, showing the distribution by States of the Ben Davis apple, each dot representing 100,000 bushels, the total being the estimated average crop for 1909 to 1913, inclusive. The arrangement of the dots within the State boundaries has no significance.

standpoint follows. In this discussion emphasis is placed on the

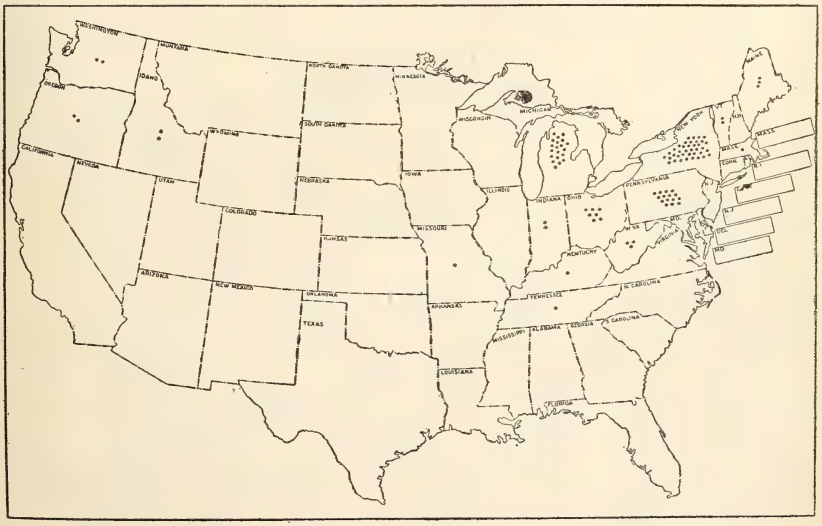


FIG. 5.—Outline map of the United States, showing the distribution by States of the Northern Spy apple, each dot representing 100,000 bushels, the total being the estimated average crop for 1909 to 1913, inclusive. The arrangement of the dots within the State boundaries has no significance.

centers or areas of commercial apple growing, but the general distribution of this fruit is also indicated.

With the exception of relatively small areas located in the South Atlantic and Gulf coast regions where it is too warm, in the upper

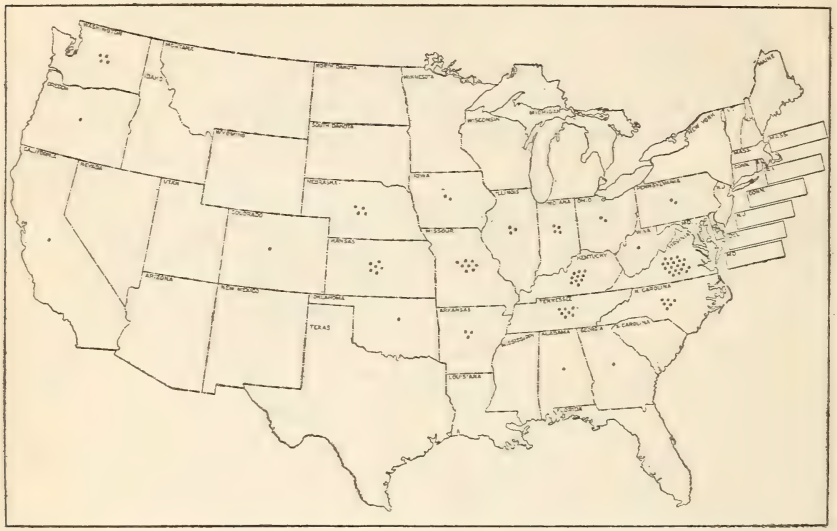


FIG. 6.—Outline map of the United States, showing the distribution by States of the Winesap apple, each dot representing 100,000 bushels, the total being the estimated average crop for 1909 to 1913, inclusive. The arrangement of the dots within the State boundaries has no significance.

Mississippi Valley where it is too cold, and in some sections of the

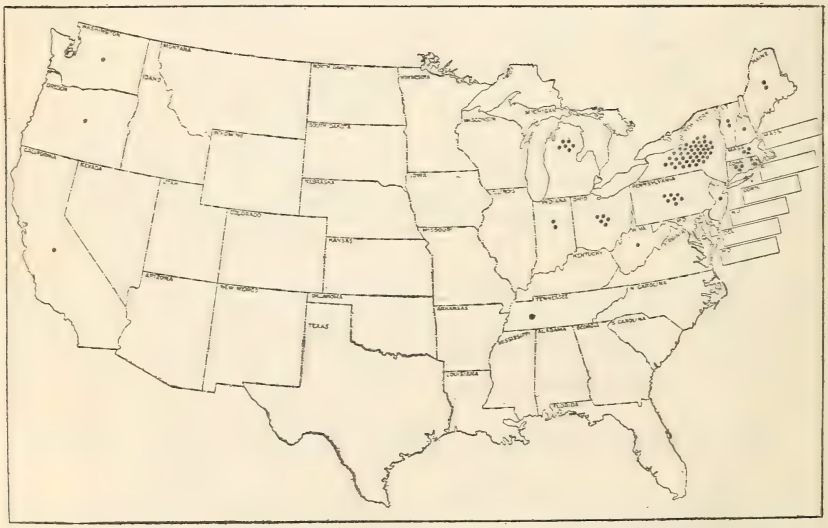
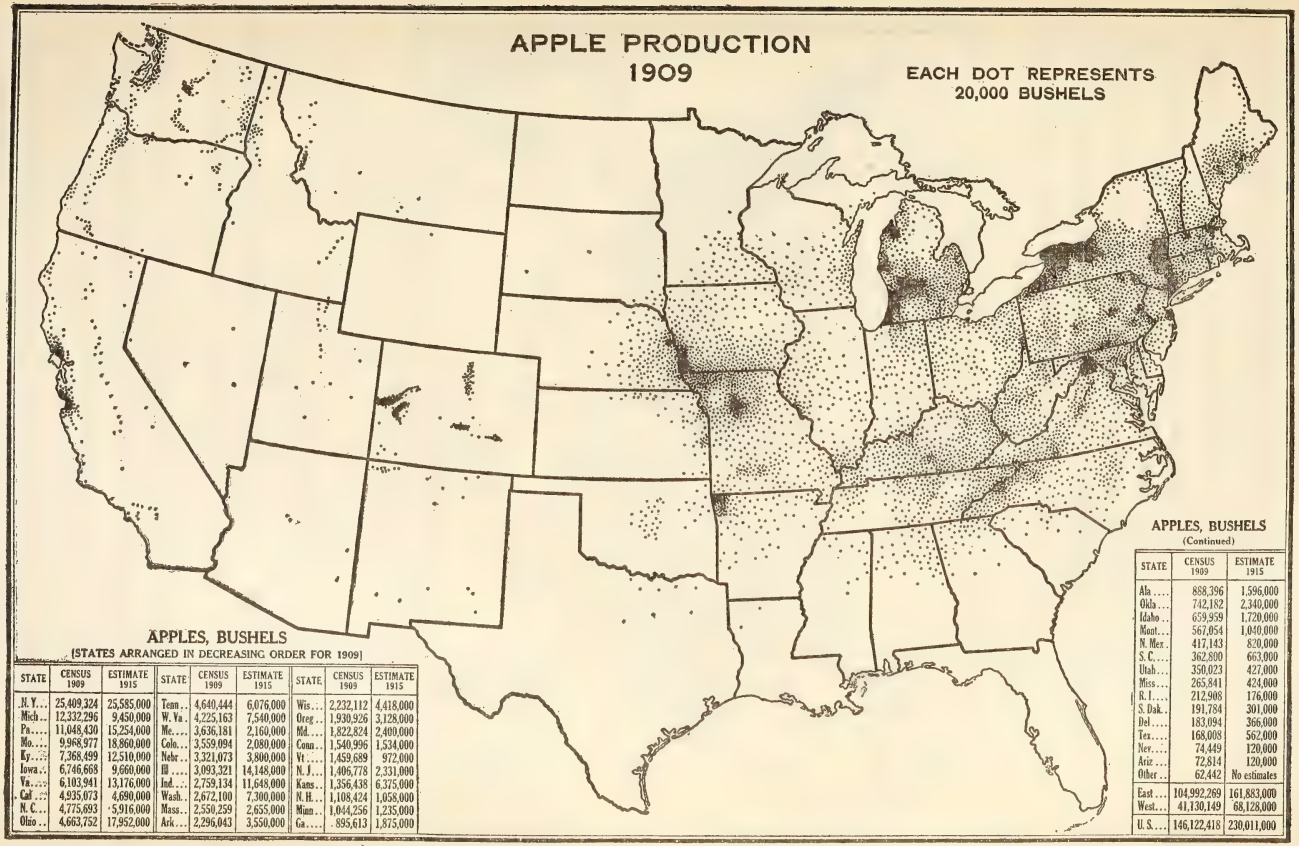


FIG. 7.—Outline map of the United States, showing the distribution by States of the Rhode Island Greening apple, each dot representing 100,000 bushels, the total being the estimated average crop for 1909 to 1913, inclusive. The arrangement of the dots within the State boundaries has no significance.

semiarid regions and in the intermountain States where it is either too cold or too dry, or both, there is hardly a community where



APPLES, BUSHELS

[STATES ARRANGED IN DECREASING ORDER FOR 1909]

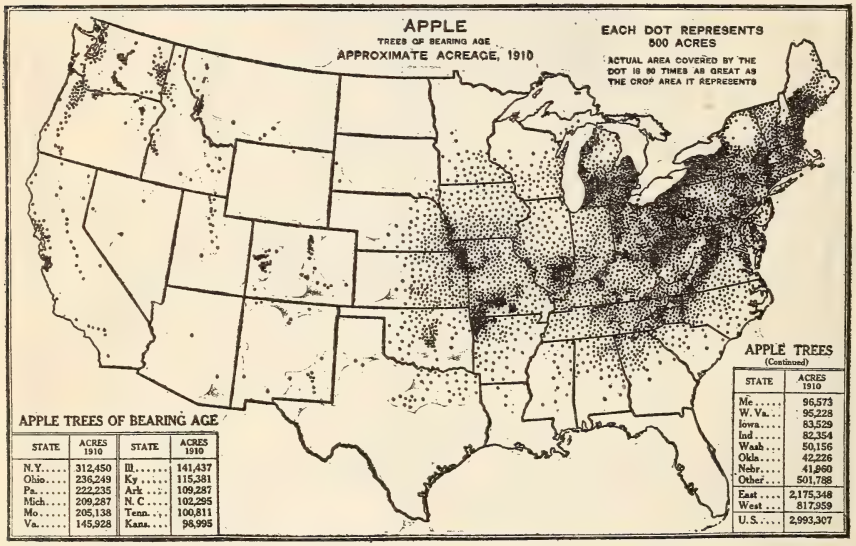
STATE	CENSUS 1909	ESTIMATE 1915	STATE	CENSUS 1909	ESTIMATE 1915	STATE	CENSUS 1909	ESTIMATE 1915
N. Y...	25,409,324	25,585,000	Tenn..	4,640,444	6,076,000	Wis...	2,232,112	4,418,000
Mich..	12,332,296	9,450,000	W. Va.	4,225,163	7,540,000	Oreg..	1,930,926	3,128,000
Pa....	11,048,430	15,254,000	Me....	3,636,181	2,160,000	Md....	1,822,824	2,400,000
Mo....	9,968,977	18,860,000	Colo...	3,559,094	2,080,000	Conn..	1,540,996	1,534,000
Ky....	7,368,499	12,510,000	Nebr...	3,321,073	3,800,000	Vt....	1,459,689	972,000
Iowa..	6,746,668	9,660,000	Ill	3,093,321	14,148,000	N. J...	1,406,778	2,331,000
Va....	6,102,941	13,176,000	Ind....	2,759,134	11,648,000	Kans..	1,356,438	6,375,000
Cal...	4,935,073	4,680,000	Wash..	2,672,100	7,300,000	N. H..	1,108,424	1,058,000
N. C...	4,775,693	5,916,000	Mass..	2,550,259	2,655,000	Minn..	1,044,256	1,235,000
Ohio..	4,663,752	17,952,000	Ark...	2,296,043	3,550,000	Ga....	895,613	1,875,000

APPLES, BUSHELS
(Continued)

STATE	CENSUS 1909	ESTIMATE 1915
Ala....	888,396	1,596,000
Okla...	742,182	2,340,000
Idaho..	659,959	1,720,000
Mont...	567,054	1,040,000
N. Mex.	417,143	820,000
S. C....	362,800	663,000
Utah...	350,023	427,000
Miss....	265,841	424,000
R. I....	212,908	176,000
S. Dak..	191,784	301,000
Del....	183,094	366,000
Tex....	168,008	562,000
Nev....	74,449	120,000
Ariz...	72,814	120,000
Other..	62,442	No estimates
East...	104,992,269	161,883,000
West...	41,130,149	68,128,000
U. S....	146,122,418	230,011,000

FIG. 8.—Outline map of the United States, showing the distribution of apple production in 1909. Each dot represents 20,000 bushels.

apples are not grown to a greater or less extent. The distribution of production based on the reports of the Thirteenth Census is shown in the map designated as figure 8.[1] On this map each dot represents 20,000 bushels on the basis of the crop of 1909, which is the one reported in the last census. The arrangement of the dots on the map is definite and significant, being so placed as to show the geographical distribution of the crop in each State by counties. The heavily shaded areas denote sections of very large production. The clear spaces do not indicate necessarily areas of no apple production, but areas in which the production is so small that no county has a yield amounting to 20,000 bushels.


APPLE
TREES OF BEARING AGE
APPROXIMATE ACREAGE, 1910
EACH DOT REPRESENTS
500 ACRES
ACTUAL AREA COVERED BY THE DOT IS 80 TIMES AS GREAT AS THE CROP AREA IT REPRESENTS
APPLE TREES OF BEARING AGE
APPLE TREES (Continued)

STATE	ACRES 1910	STATE	ACRES 1910
N.Y.	312,450	Ill.	141,437
Ohio	236,249	Ky.	115,381
Pa.	222,235	Ark.	109,287
Mich.	209,287	N. C.	102,295
Mo.	205,138	Tenn.	100,811
Va.	145,928	Kans.	98,995

STATE	ACRES 1910
Me.	96,573
W. Va.	95,228
Iowa	83,529
Ind.	82,354
Wash.	50,156
Okla.	42,226
Nebr.	41,860
Other	501,788
East	2,175,348
West	817,959
U. S.	2,993,307

FIG. 9.—Outline map of the United States, showing the approximate distribution of apple orchards of bearing age in 1910. Each dot represents 500 acres.

Figure 9 shows the distribution of apple trees of bearing age, as reported by the Thirteenth Census. In the same way, the distribution of trees of nonbearing age is shown in figure 10. In these two figures each dot represents 500 acres of apple trees. The arrangement of the dots and their positions on the maps have the same significance as those in figure 8.

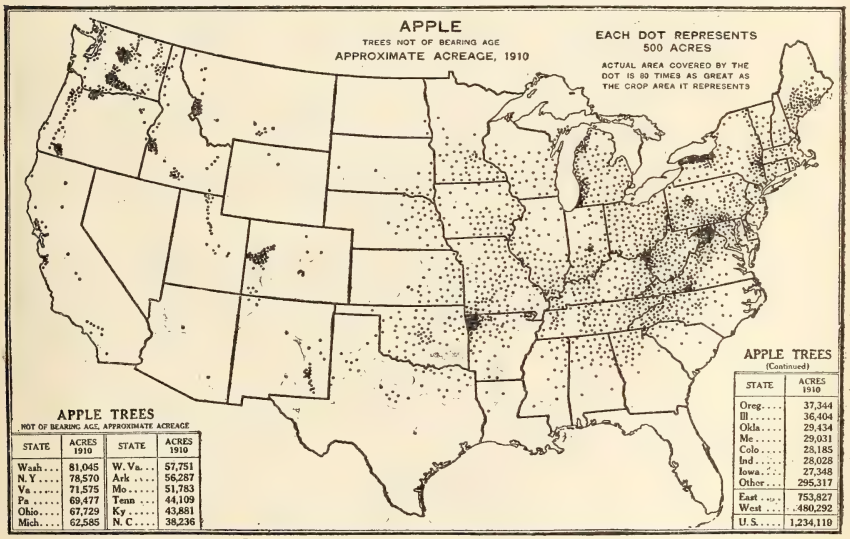
It is impracticable to present a complete inventory of the apple industry from the standpoint of the distribution of the entire production, but it is believed that an outline of the more important centers and areas of the commercial interests will be of constructive value to all who are concerned with the industry, and at the same time it will

[1] This map, also those designated as figures 9 and 10, are from the Yearbook of the Department of Agriculture for 1915.

supply a type of information the demand for which seems to be increasing.

In indicating where the more important apple-producing sections are located, it is not possible to give the information for the different States with a uniform degree of definiteness, because of the differences in the distribution of the orchards and also because of a lack of sufficient data. In some parts of the country the apple-producing areas are rather indefinite in their extent, with no well-defined boundaries; in others, as in some of the irrigated valleys of the West, the areas are very definitely delimited.

The locations of the more important areas of production, as outlined in the present connection, are indicated largely on the basis of


APPLE
TREES NOT OF BEARING AGE
APPROXIMATE ACREAGE, 1910
EACH DOT REPRESENTS
500 ACRES
ACTUAL AREA COVERED BY THE DOT IS 80 TIMES AS GREAT AS THE CROP AREA IT REPRESENTS

APPLE TREES
NOT OF BEARING AGE, APPROXIMATE ACREAGE

STATE	ACRES 1910	STATE	ACRES 1910
Wash.	81,045	W. Va.	57,751
N. Y.	78,570	Ark.	56,287
Va.	71,575	Mo.	51,783
Pa.	69,477	Tenn.	44,109
Ohio.	67,729	Ky.	43,881
Mich.	62,585	N. C.	38,236

APPLE TREES
(Continued)

STATE	ACRES 1910
Oreg.	37,344
Ill.	36,404
Okla.	29,434
Me.	29,031
Colo.	28,185
Ind.	28,028
Iowa.	27,348
Other	295,317
East	753,827
West	480,292
U. S.	1,234,110

FIG. 10.—Outline map of the United States, showing the approximate distribution of apple orchards of nonbearing age in 1910. Each dot represents 500 acres.

information from leading fruit growers, officers of horticultural societies, experiment station officials, and others who by virtue of their relation to the fruit interests in their respective States are especially familiar with the sources of production. This information was supplied in response to a circular letter sent from the Bureau of Plant Industry. In most cases the varieties listed for planting in the different centers or areas of production were named by the same correspondents. The varieties in the various lists are named in alphabetical order. The relative importance of most of the principal varieties in each State is shown in figure 2 and Table III. It should be stated further that in many instances counties not included in the areas of commercial production are reported by the last census to have a larger number of trees than other counties designated as

having commercial interests. The explanation is that a comparatively few thousand trees, if planted in a few relatively large orchards in some locality, may make a community industry of considerable size, while an equal or even a much larger number of trees widely distributed in a county in small home orchards would be entirely without commercial significance.

The order in which the different States are mentioned follows the grouping used in the reports of the Thirteenth Census.

NEW ENGLAND STATES.

MAINE.

Distribution.—Apples are grown somewhat generally throughout the southern half of Maine, with no special centers of production. They are of small relative importance as a crop in the northern sections. Most orchards are on farms where general agriculture is practiced, few specializing in apple growing. The section in which apples are of most importance includes all counties in the southern part of the State, extending as far north as and including practically all of Franklin County and the southern parts of Somerset, Piscataquis, Penobscot, and Hancock Counties.

Varieties.—Baldwin, Ben Davis, Gravenstein, McIntosh, Milden, Northern Spy, Oldenburg, Rhode Island Greening, Rolfe, Stark, and Tompkins King. In the northern sections of Maine, Dudley, Fameuse, and Wealthy are of value because of their hardiness. The Ben Davis, though it has been profitable with some growers, is not to be recommended generally for planting in the northern apple-growing sections.

NEW HAMPSHIRE.

Distribution.—Apple growing is more or less general throughout most parts of New Hampshire. The commercial orchards are in the southern half of the State and are quite widely distributed in the southern portions of Grafton and Carroll Counties and southward, with important centers of production located near the central parts of Hillsboro and Merrimack Counties, in the eastern part of Hillsboro extending into the southwestern part of Rockingham County, with a fourth section in the eastern part of Rockingham County.

Varieties.—Baldwin, Hubbardston, McIntosh, Rhode Island Greening, Northern Spy, Tompkins King, and Wealthy.

VERMONT.

Distribution.—While farm orchards occur more or less generally in Vermont, the principal commercial interests are in Grand Isle County, centering about Isle La Motte, Grand Isle, and South Hero,

the western parts of Chittenden and Addison Counties bordering on Lake Champlain, the southwestern part of Bennington County, and the southern and eastern sections of Windham County.

Varieties.—Arctic, Baldwin, Ben Davis,[1] Fameuse, McIntosh, Northern Spy, Rhode Island Greening, Tolman, and Wealthy.

MASSACHUSETTS.

Distribution.—Doubtless apple growing is more generally distributed throughout Massachusetts than in any previously mentioned State. Relatively important areas are indicated as follows:

(1) Western Franklin County, centering about Heath, Colerain, Ashfield, and Buckland.

(2) Northeastern Worcester County, centering about Leominster, Fitchburg, Bolton, and Harvard.

(3) Western Middlesex County, centering about Hudson, Marlboro, Boxboro, and Littleton (this area being the eastern extension of area 2, and parts of Essex County.

(4) Central Berkshire County.

(5) Central parts of Hampshire and Hampden Counties.

Varieties.—In area 1, Baldwin, Northern Spy, and Rhode Island Greening are the principal sorts. In area 2, same as area 1; also McIntosh, Red Astrachan, Wealthy, and Yellow Transparent. In areas 3, 4, and 5, same as in area 2; also Gravenstein, Oldenburg, and Roxbury. The Hubbardston and Williams are also grown in some parts of the State.

RHODE ISLAND.

Distribution.—Apples are grown commercially to some extent throughout Rhode Island. The larger interests are in Providence County (centering in Johnston, Smithfield, Foster, and Cumberland Townships), and in Richmond Township in Washington County.

Varieties.—Baldwin, McIntosh, Northern Spy, Rhode Island Greening, and Wagener.

CONNECTICUT.

Distribution.—Apple growing is not centralized in Connecticut, but relatively large orchards are located in nearly every county. Some of the more important townships from the standpoint of the apple industry are Danbury and Greenwich in Fairfield County; Cheshire, Milford, Oxford, and Wallingford in New Haven County; Durham and Middlefield in Middlesex County; Cornwall and Salisbury in Litchfield County; Farmington, Glastonbury, and Southington in Hartford County; Woodstock in Windham County.

Varieties.—Baldwin, Fall Pippin, McIntosh, Rhode Island Greening, Roxbury, Tompkins King, and Wealthy.

[1] See under "Maine" (p. 14) for comment regarding Ben Davis.

MIDDLE ATLANTIC STATES

NEW YORK.

Distribution.—Reference to the diagram in figure 2 and the map (fig. 8) will emphasize the relative importance of New York as compared with other States in the quantity of apples produced. They are grown widely throughout most parts of the State, but the areas which are of great commercial importance are fairly definite, being located in the Hudson River valley and in the western part of the State. The former region consists essentially of the parts of Putnam, Orange, Dutchess, Ulster, Columbia, and Green Counties that are within a comparatively short distance of the river. In the western part of the State the counties that border Lake Ontario—Niagara, Orleans, Monroe, Wayne, Cayuga, and the western portion of Oswego—comprise the famous western New York apple district, though in reality this district also includes parts of Genesee and Livingston Counties (which are in the second tier of counties from Lake Ontario) and a large number of important orchards located about the "finger lakes" in central-western New York. It is to be observed also by referring to the acreage maps (figs. 9 and 10) that there are interests of some importance in the Lake Champlain section and in the St. Lawrence Valley. The fruit from the last two sections, however, does not enter largely into the trade.

Varieties.—Baldwin, Fall Pippin, Gravenstein, Hubbardston, McIntosh, Northern Spy, Oldenburg, Rhode Island Greening, Roxbury, Tompkins King, Twenty Ounce, Wagener, and Wealthy.

The Rome Beauty and Boiken were included in a list suggested for Livingston County. The Yellow Newtown is grown successfully in restricted localities in the Hudson River valley. It is of interest to note that the Ben Davis, though comprising 5 per cent of the crop of the State (Table III), was not named by any of the correspondents reporting in this connection.

NEW JERSEY.

Distribution.—Conditions are well suited to the growing of apples in most sections of New Jersey, especially in the central and northern parts. The chief commercial activities, except as they may be represented by individual orchards in other parts of the State, are located in Burlington, Monmouth, Camden, and Gloucester Counties, in which Riverton, Moorestown, Marlton, Middletown, Red Bank, Merchantville, and Glassboro represent important points of production.

Varieties.—A larger number of varieties have an important commercial status in New Jersey than in many States, because of the

development of relatively large summer-apple interests. The principal sorts are as follows: Baldwin, Ben Davis, Fall Pippin, Gravenstein, Grimes, Jonathan, Maiden Blush, Oldenburg, Red Astrachan, Rome Beauty, Smokehouse, Starr, Stayman Winesap, Wealthy, Williams, Winesap, Yellow Transparent, and York Imperial.

Perhaps no variety is in a larger number of orchards in New Jersey than Smith Cider; but it occurs only in those planted at a comparatively early period, having been dropped entirely in the more recently planted orchards. It is the conviction of some that the McIntosh and Arkansas (or Paragon)[1] will increase in importance as the younger orchards develop. Though not generally planted in New Jersey, the English Codlin has proved quite profitable in some of the early apple orchards in Monmouth County, while the Baldwin is of value chiefly in the northern sections of the State.

PENNSYLVANIA.

Distribution.—In 1910, when the last census was taken, Pennsylvania, on a State basis, ranked sixth in the combined number of bearing and nonbearing apple trees, and the crop of 1909 fell only slightly below that of New York, which ranked first in production. The wide distribution throughout the State is indicated by the fact that only six counties were reported to have less than 40,000 trees each of bearing age. Yet the commercial interests, so far as interstate shipments are concerned, are relatively small, and the centers of production correspondingly difficult to define. Probably the interests in York, Adams, Franklin, and Bedford Counties, in the south-central part, are more generally recognized in the commercial apple industry than are those in most other parts of the State. Luzerne County, in east-central Pennsylvania, also contains interests of considerable extent.

On account of the great number of large industrial towns in Pennsylvania the opportunities for growers of fruit and vegetables to cater to local markets are exceptionally good, and no doubt this accounts in a measure for the fact that so few definite centers of commercial production have been developed.

Varieties.—There are at least two fairly definite pomological regions in Pennsylvania. Three such regions are sometimes recognized. In general, the northern half of the State represents what is sometimes termed the Baldwin–Rhode Island Greening–Northern Spy territory, and the southern half represents the Ben Davis–York Imperial–Winesap area.

[1] Arkansas and Paragon are so nearly alike that it is practically impossible to distinguish definitely the fruit of the one from the other.

A list of varieties that has been suggested for Luzerne County, located in the northern region, in order to provide for a long sequence in ripening, is as follows: (9) [1] Baldwin, (4) Gravenstein, (7) McIntosh, (3) Oldenburg, (2) Red Astrachan, (6) Smokehouse, (10) Stark, (8) Wagener, (5) Wealthy, (1) Yellow Transparent.

In the southern part of Pennsylvania the following varieties predominate in the commercial orchards: Stayman Winesap, York Imperial, Rome Beauty, and Grimes.

Many other varieties occur in Pennsylvania, but the ones named are especially important. Mention in this connection should be made of the Rhode Island Greening and Northern Spy (which occur in the northern part of the State and amount to 5.5 per cent and 11.4 per cent, respectively, of the crop) and the Ben Davis (which occurs more or less generally and which amounts to 6 per cent of the crop).[2] These varieties, however, are evidently in the older orchards, as they do not appear to be commonly recommended for planting anywhere in this State at the present time.

EAST NORTH-CENTRAL STATES.

OHIO.

Distribution.—Commercial apple growing in Ohio is largely in the southern and southeastern part of the State in the counties bordering the Ohio River and in the counties in the northern part which are influenced by the proximity of Lake Erie. There are interests also of some recognized importance in the central sections of the State. The counties especially mentioned are as follows:

In the Ohio River valley: Belmont, Monroe, Noble, Washington, Athens, Meigs, Gallia, Jackson, Lawrence, Clermont, and Hamilton.

In the central sections: Ross, Fairfield, Franklin, and Delaware.

In the northern part: Lake, Erie, Sandusky, Ottawa, Lucas, and Seneca.

Varieties.—For the northern sections: Baldwin, Ben Davis, Grimes, Jonathan, Northern Spy, and Rhode Island Greening. For the central and southern sections, Rome Beauty (especially in addition to Ben Davis and Grimes named above). Stayman Winesap may also be expected to give good results in these sections of the State.

INDIANA.

Distribution.—Apple growing is generalized in Indiana. The interests are widely distributed in the northern and eastern tiers of counties, in the counties in the north-central part of the State

[1] The number in parentheses preceding each name indicates its sequence of ripening as related to the others in the list.

[2] See Table III for the percentages of other varieties.

through which the Wabash River flows, in the Wabash, White, and White Water River valleys, and generally throughout the southern half of the State. There are two sections of Indiana in which apples are of little importance, namely, the central part south of the Wabash River and the northwestern part which lies between the counties through which the Wabash River flows and the northern tier of counties.

Varieties.—Ben Davis, Grimes, Indiana Favorite, Jonathan, Rome Beauty, Stark, Wealthy, Winesap, and Yellow Transparent. The varieties not here included which are named for northern Ohio are grown more or less also in northern Indiana. The relative importance of several of them is shown under "Indiana" in connection with Table III.

ILLINOIS.

Distribution.—There are three general areas in Illinois in which the larger commercial apple interests are centralized. The most important development in its extent includes Clay County in the south-central part of the State, which has the largest acreage devoted to apple growing of any county in the State; Wayne, Marion, Richland, Jasper, and Crawford Counties, in all of which there are large acreages; and Cumberland, Jefferson, and Washington Counties, in which smaller interests are located. The second region in importance is in the west-central part of the State and includes Hancock, Adams, Pike, and Calhoun Counties, all of which border on the Mississippi River, and Greene and Jersey Counties, which are adjacent to Calhoun on the east. A third area fairly well defined is in the extreme southern part of the State and consists of the following counties: Jackson, Williamson, Saline, Gallatin, Union, Johnson, Pope, and Massac. In addition to these three somewhat well-defined areas, there are important individual orchards in a number of other counties, including Champaign, Dewitt, Macon, McLean, Bureau, and perhaps others.

Varieties.—The principal varieties for most parts of Illinois are Ben Davis, Grimes, Jonathan, and Rome Beauty. In the extreme southern counties, in addition to the first three named, Stayman Winesap, Winesap, and York Imperial are important sorts.

In Marion County, summer apples are grown quite extensively. Yellow Transparent, Oldenburg, and Benoni are especially important varieties.

Other varieties of more or less general importance in most sections of the State include Early Harvest, Red June, Maiden Blush, and Wealthy for early, and Gano, Minkler, Willowtwig, and a few others for long-keeping sorts.

MICHIGAN.

Distribution.—The commercial apple interests in Michigan extend throughout the western portion of the State from Berrien County in the southwest to the Grand Traverse region in the northwest. This region covers approximately the first and second tiers of counties from Lake Michigan as far north as Manistee County, one tier northward from and including that county, and Benzie, Leelanau, and parts of Grand Traverse, Antrim, and Charlevoix Counties. Oakland County, in the southeastern part of the State, also contains large apple interests, as well as several others in the two southern tiers. Besides the regions thus indicated, orchards of commercial standing occur in most sections of the lower peninsula. Apples are of comparatively little commercial importance in the northern peninsula.

Varieties.—Baldwin, Fameuse, Grimes, Hubbardston, Jonathan, McIntosh, Maiden Blush, Northern Spy, Oldenburg, Red Canada, Rhode Island Greening, Tompkins King, Wagener, Wealthy, and Yellow Transparent.

The relative commercial importance of the above varieties is suggested with fair accuracy by the percentages given in Table III.

WISCONSIN.

Distribution.—A large part of the apples produced in Wisconsin are grown in home orchards, a considerable proportion of which are in the counties in the southeastern part of the State bordering on Lake Michigan. Commercial interests of considerable extent are located in Door County, north of the channel, including Washington Island, and north of the Wisconsin River in the southwestern part of the State, in Crawford, Richland, and Sauk Counties. Commercial orchards also occupy a relatively small area in the Bayfield Peninsula in the extreme northern part of the State, where the ameliorating influence of Lake Superior on the winter temperatures makes possible the production of fruits which it is quite impossible to grow in other northern parts of the State.

Varieties.—Dudley, Fameuse, McIntosh, McMahon, Northwestern, Oldenburg, and Wealthy.

The secretary of the Wisconsin Horticultural Society reports that only such varieties as Hibernal, Malinda, Oldenburg, Longfield, and Charlamoff are hardy north of parallel 45° except in the Bayfield Peninsula region.

WEST NORTH-CENTRAL STATES.

MINNESOTA.

Distribution.—While some of the very hardy varieties of apples are quite widely grown throughout the southern sections of Minnesota, the commercial interests, which are not extensive, are rather

definitely confined to the southeastern part of the State. Probably the most important section is the Minnetonka Lake region in Hennepin and Carver Counties, but orchards of some commercial imporance occur in the counties that comprise a triangular area in the southeastern part of the State that is bordered by the Mississippi River, extending as far north as and including Wright County, and on the west in a general way by a line passing from that county through the eastern part of Jackson County, which is in the south-central part of the State. This area is indicated on the map (fig. 8).

Varieties.—The varieties chiefly grown are the hardy sorts—Hibernal, Northwestern, Oldenburg, Patten, Scott Winter, Wealthy, and Wolf River.

Considerable attention has been given to the possibility of growing some of the tenderer but higher quality varieties by top-working them on hardy varieties, such as Patten, Wealthy, and the Virginia crab. So handled, such varieties as Banana, Grimes, and Jonathan have been grown, with promise of considerable success.

IOWA.

Distribution.—Apple growing is distributed rather generally in Iowa, being appreciably more extensive in the southern than in the northern part, with the chief commercial interests in the southwestern section in Fremont, Page, Taylor, Mills, Pottawattamie, and Harrison Counties.

Varieties.—For northern Iowa, where resistance to severe winter conditions is an essential tree quality: Brilliant, Malinda, Northwestern, Oldenburg, Patten, Salome, Wealthy, and Windsor. For southern Iowa, where the principal commercial interests are located: Ben Davis, Grimes, Gano, Jonathan, Stayman Winesap, and Winesap.

The following is a list of varieties (named in the approximate order in which they ripen) suitable for planting in most parts of the State where a continuous supply of fruit from early to late is desired for home use: Yellow Transparent, Livland, Oldenburg, Charlamoff, Whitney, Benoni, Dyer, Wealthy, Brilliant, Patten, Ramsdell (sweet), Fameuse, McIntosh, Northwestern, Black Annette, Tolman (sweet), and Windsor.

MISSOURI.

Distribution.—The Thirteenth Census reported for Missouri nearly 3,000,000 more apple trees of bearing age than for any other one State, and it was exceeded by only two States in the number of trees not of bearing age. This naturally means a very general distribution of apples throughout the State, as is indicated by the maps (figs. 8, 9, and 10). However, there are certain sections in which the more

important commercial interests have been developed. Of these the Ozark region in the southwestern part of the State is doubtless the most widely known. The orchards in this region are located largely in McDonald, Newton, and Lawrence Counties, and in those through which the St. Louis and San Francisco Railroad passes, including Greene, Webster, Wright (southern part), Texas (southwestern part), Howell, and Oregon (southwestern part). In the northwestern part of the State, Holt, Andrew, Buchanan, Platte, and Clay Counties form a portion of an important district which is made up of this portion of northwestern Missouri and adjacent sections of northeastern Kansas, southeastern Nebraska, and southwestern Iowa.

There are also important localities in other counties in Missouri (bordering on the Missouri River), of which Jackson, Lafayette, Carroll, Saline, and Howard may be especially mentioned. Pike County, which borders on the Mississippi River in the northeastern quarter of the State, also has large interests.

Varieties.—Many varieties are grown in the commercial orchards, but the leading ones are Arkansas (*Mammoth Black Twig*), Ben Davis, Delicious, Gano, Grimes, Ingram, Jonathan, Missouri (*Missouri Pippin*), Winesap, and York Imperial.

NORTH DAKOTA.

Distribution.—Apples are not grown commercially in North Dakota, except as they may be marketed locally in small quantities from some of the small ranch orchards.

Varieties.—The hardy varieties suggested for northern Wisconsin and for Minnesota include those commonly planted in the limited extent to which apples are produced in this State.

SOUTH DAKOTA.

Distribution.—Apple growing can hardly be termed a commercial industry in South Dakota, yet the conditions in a considerable portion of the State admit of maintaining small home orchards, which supply more or less fruit for local markets.

The State Horticultural Society divides the State into four districts: Northern—that part north of a line running east and west through Watertown; central—that part between the northern district and a line running east and west through Sioux Falls; southern—the part south of the central district; Black Hills—the area in the southwestern part of the State commonly known by this name.

It is claimed that in the seven or eight counties in the extreme southeastern corner of the State more apples are grown than in all the rest of the State outside the Black Hills district.

Varieties.—The State Horticultural Society names the following for the different districts:

Northern district.—First degree of hardiness, Hibernal and Oldenburg; second degree of hardiness, Anisim, Patten, and Wealthy.

Central district.—Same as for the northern district, with Malinda added to the second group.

Southern district.—Anisim, Iowa Blush, Malinda, Northwestern, Oldenburg, Patten, and Wealthy.

Black Hills district.—Summer: Tetofski, Yellow Transparent, Charlamoff, and Oldenburg. Fall: Wealthy, Okabena, Longfield, Wolf River, and Patten. Winter: McIntosh, Ben Davis, and Gano.

The following varieties are also recommended for trial generally throughout the State: Dudley, Iowa Beauty, Livland, Longfield, Milwaukee, and Yellow Transparent. The Hibernal is especially recommended as a hardy stock upon which to top-work other varieties.

NEBRASKA.

Distribution.—Home orchards occur widely throughout a large portion of Nebraska, but especially in the eastern half. The commercial interests are quite definitely located in the southeastern section and are largely in the following counties: Richardson, Pawnee, Nemaha, Johnson, Gage, Otoe, Cass, and Lancaster (all south of the Platte River); and Sarpy, Douglas, Saunders, Washington, and Burt (north of the Platte and bordering on the Missouri River).

Varieties.—The principal commercial varieties are Arkansas, Ben Davis, Gano, Grimes, Jonathan, Missouri, Wealthy, Winesap, and Oldenburg.

For general planting, the above-named varieties may be used in a large portion of the State. The winter varieties in the list are the ones commonly found in the home orchards. The State Horticultural Society suggests for most sections the following: For early ripening—Benoni, Early Cooper, Early Harvest, Red Astrachan, and Yellow Transparent. For fall ripening—Dyer, Maiden Blush, Plumb Cider, and Utter. For sections where the conditions are especially severe, the varieties named for the southern section of South Dakota are suggested in the present connection.

KANSAS.

Distribution.—So far as the general distribtuion of apples in Kansas is concerned, the conditions are not materially different from those in Nebraska. There are two fairly well-defined regions of commercial interest. One of these is in the northeastern corner of the State, and this, with contiguous areas in the adjacent States, makes up a region in which great commercial interests are located. The part of this region in Kansas consists primarily of the following

counties: Doniphan, Brown, Nemaha, Atchison, Jackson, Wyandotte, Leavenworth, Jefferson, Shawnee, Johnson, Douglas, Miami, Franklin, and Linn.

The second region is in the Arkansas River valley in Reno, Sedgwick, Cowley, and Sumner Counties. In this region the principal orchards are located within a comparatively short distance of the river.

It should also be added that there are large orchards in many other counties in the eastern part of the State, especially south of the Kansas River, but they do not represent the heavy concentration of orchard interests that prevails in the regions designated. Morris, Lyon, and Greenwood Counties are representative of this latter group.

Varieties.—Arkansas, Ben Davis, Early Cooper, Gano, Grimes, Jonathan, Maiden Blush, Missouri, Rome Beauty, Stayman Winesap, Winesap, and York Imperial. The Delicious is also giving promising results in some of the younger orchards in both of the principal commercial regions. In the Arkansas River valley the King David is highly regarded by some growers.

SOUTH ATLANTIC STATES.

DELAWARE.

Distribution.—Apple growing is rather general in Delaware, with the largest commercial interests located in the central part of the State in Kent County. Wyoming is probably the largest shipping point. Dover, Smyrna, and Felton are other points having interests of considerable magnitude. Middletown in Newcastle County and Bridgeville in Sussex County are also centers of some importance.

Varieties.—Summer-apple growing is a prominent phase of the industry. The following early sorts are largely grown: Yellow Transparent, Early Ripe, Red Astrachan, and Williams (*Williams Early Red*). The principal long-keeping varieties are Arkansas (or Paragon),[1] Ben Davis, Jonathan, Nero, Rome Beauty, Stayman Winesap, Winesap, and York Imperial. Grimes is reported from the vicinity of Middletown and King David from the Wyoming section.

MARYLAND.

Distribution.—The leading apple-producing counties in Maryland are Allegany, Washington, Frederick, Montgomery, and Kent. The commercial interests are somewhat widely distributed in these counties, while individual orchards of considerable importance occur in many other parts of the State.

[1] See footnote under "New Jersey" (p. 17) for explanation relating to these varieties.

Varieties.—Ben Davis, Grimes, Jonathan, Oldenburg, Stayman Winesap, Williams, Winesap, Yellow Transparent, and York Imperial. In some of the Eastern Shore counties the Arkansas (or Paragon) occurs frequently, while in Garrett County, in the extreme western part of the State, where the elevations are high, the Baldwin is a relatively important variety.

VIRGINIA.

Distribution.—The commercial apple-orchard interests in Virginia are located mostly in the Piedmont, Blue Ridge, and Shenandoah Valley regions. In a general way, the statement is accurate that these three regions include the two tiers of counties which extend in a northeast-southwest direction throughout the State and which have a common boundary on the crest of the Blue Ridge Mountains. In some sections where the counties are small, this area is three counties in width. This territory as a commercial apple-producing area may be said to extend as far west as Pulaski and Carroll Counties, but interests of considerable magnitude are being developed in other counties in the southwestern part of the State, including Grayson, Wythe, Smythe, Russell, and possibly others. Several counties in the northern part of Virginia also have orchards of considerable importance individually, but they do not make up community interests of large extent.

Varieties.—While many varieties occur, especially in the older orchards, those which largely make up the commercial industry are Arkansas (*Mammoth Black Twig*), Ben Davis, Grimes, Rome Beauty, Stayman Winesap, Winesap, Yellow Newtown (*Albemarle Pippin*)—grown to some extent in the coves, on the spurs, and on the eastern slope of the Blue Ridge—and York Imperial.

WEST VIRGINIA.

Distribution.—There are three regions in West Virginia of particular prominence for commercial apple production. The seven counties that comprise the eastern "panhandle," so-called, form one of these regions, the four eastern counties constituting the more important part. The four counties that constitute the northern panhandle make another region of considerable prominence, Hancock County being the most widely known section of this region. A third region consists of the counties that border on the Ohio River, extending from and including Wayne County on the south to Pleasant County on the north. In this region the orchards are located mostly within a few miles of the river.

The northern panhandle region is in some respects a northern extension of this Ohio River valley region, but the existence of certain climatic differences warrants their recognition as separate regions.

Commercial orchards of some prominence exist in other counties, as in Barbour, Randolph, Greenbrier, and perhaps others, but the interests in them are not heavily centralized.

Varieties.—Arkansas (*Mammoth Black Twig*), Baldwin, Ben Davis, Gano, Grimes, Jonathan, Rome Beauty, Stayman Winesap, Wealthy, Willowtwig, and York Imperial.

The Ohio River valley region is characterized by the Rome Beauty; the northern panhandle region by Baldwin and Willowtwig. The eastern region is the northern extension of the Shenandoah Valley region in Virginia.

NORTH CAROLINA.

Distribution.—The commercial apple interests in North Carolina are located in the mountain districts in the western part of the State. The principal centers are in Surry County about Mount Airy; in the Brushy Mountain section, tributary to Northwilkesboro in Wilkes County; and Buncombe and Haywood Counties. As in West Virginia, orchards of considerable size are located in other counties than those named, but as a rule they do not constitute large community interests.

Varieties.—Arkansas, Grimes, Limbertwig, Rome Beauty, Royal Limbertwig, Stayman Winesap, Winesap, and York Imperial. In some of the older orchards, especially in Buncombe and Haywood Counties, the Yellow Newtown (*Albemarle Pippin*) occurs more or less, but it is rarely planted in this section at the present time. The Limbertwig occurs mostly in the orchards in Surry and Wilkes Counties. The Ben Davis comprises 7.5 per cent of the total crop of the State; Early Harvest, 7.2 per cent; Horse, 7.2 per cent; and Red June, 5.9 per cent (p. 5), but these varieties apparently are widely distributed and occur more largely in home orchards than in those of commercial size. Though the Ben Davis is in some of the larger orchards, it is apparently a relatively unimportant variety from a commercial standpoint. The Delicious is reported to do well in some sections of western North Carolina.

SOUTH CAROLINA.

Distribution.—The commercial apple interests in South Carolina are relatively small. They are located principally in the extreme western part of the State in Spartanburg, Greenville, Anderson, Pickens, and Oconee Counties.

Varieties.—The relatively long-keeping varieties that are considered of particular value in the above-named counties are Arkansas *(Mammoth Black Twig)*, Delicious, Scott Cluster, and Yates. Other varieties more or less popular are Ben Davis, Gano, Shockley, and Winesap. At some of the higher elevations in Greenville, Pickens, and Oconee Counties the Kinnard is valuable. Early Harvest, Horse, and Red June are the principal summer varieties. The early varieties are grown somewhat widely in the central as well as in the western sections of the State.

GEORGIA.

Distribution.—Apple growing in Georgia on a commercial basis is confined principally to Rabun and Habersham Counties in the northeastern part of the State. A few orchards have been developed in White, Union, Lumpkin, and other counties in northern and northwestern Georgia, where the elevations in the southern extension of the Blue Ridge Mountains are comparatively high. No apples of importance are grown south of Atlanta.

Varieties.—Arkansas *(Mammoth Black Twig)*, Arkansas Black, Ben Davis, Kinnard (at the higher elevations), Shockley, Stayman Winesap, Terry, Winesap, Yates, and Yellow Transparent. The Limbertwig (a long-keeping sort) and Early Harvest, Horse, and Red June (summer varieties), taken together, constitute relatively a large percentage of the entire crop of the State, but they do not occur, as a rule, in the commercial orchards. This suggests the fact that, though relatively few apples are grown in Georgia, a large proportion of the total is produced in small home orchards, of which a considerable part consists of the three summer varieties named above.

FLORIDA.

Practically no apples are grown in Florida, on account of the mildness of the climate throughout the year.

EAST SOUTH-CENTRAL STATES.

KENTUCKY.

Distribution.—The commercial orchards in Kentucky are located mostly at points along the Ohio River, quite largely in Campbell, Kenton, Jefferson, Hardin, Henderson, and McCracken Counties. Individual orchards and relatively small community interests occur in other sections, Warren, Madison, and Bath Counties being representative locations. Formerly there were very extensive orchards of the Ben Davis apple in Meade and Breckinridge Counties, which border on the Ohio River in the north-central part of the State,

but to a very considerable extent these orchards have ceased to be of commercial importance.

Varieties.—Arkansas (*Mammoth Black Twig*) or Paragon, Ben Davis, Early Harvest, Gano (or *Black Ben*), Grimes, Jonathan, Maiden Blush, Rome Beauty, Stayman Winesap, Winesap, and Yellow Transparent. In some of the older orchards the Limbertwig and Red June occur frequently.

TENNESSEE.

Distribution.—Though apple growing is widely distributed in Tennessee, the activities of commercial importance are fairly well localized. In the lower Cumberland Valley, in Bradley, Hamilton, and Rhea Counties, the interests are considerable. In Knox and several other counties in this valley there are also some orchards. The largest region is in the central part of the State and includes Sumner, Davidson, Williamson, Maury, and Lincoln Counties. Summer apples are grown quite largely in this region; also in Haywood County, in the southwestern part. In Obion County, in the northwestern part, a number of orchards are being developed.

Varieties.—The leading commercial summer apples are Early Harvest, Early Ripe, Fanny, Oldenburg, Wealthy, and Yellow Transparent. The later keeping sorts most commonly planted are Ben Davis, Paragon (or Arkansas), Stayman Winesap, Winesap, and York Imperial. In many of the small orchards that have been planted a long time Limbertwig, Horse, and Red June occur.

ALABAMA.

Distribution.—The commercial apple industry in Alabama is of rather small proportions, yet there are a few places where orchards of some importance have been developed. These are located mostly on the mountain ridges or spurs in the northeastern corner of the State. De Kalb and Madison Counties, as well as some others, have such orchards. Farther south, in the east-central part of the State, one variety—the Yates—is said to be grown in some quantity. In the southern half of the State very few apple trees occur.

Varieties.—At the higher elevations in northeastern Alabama the Early Harvest and Horse, for summer sorts, are said to do especially well. Longer-keeping varieties commonly planted are Arkansas, Gano (or *Black Ben*), Kinnard, Stayman Winesap, Winesap, and Yates. In certain orchards the Collins and Delicious are considered promising. For locations other than those having relatively high elevations, the San Jacinto, an early sort, apparently not much planted in Alabama, and for later varieties the Terry and Yates may be expected to do well. The Terry is planted quite widely in Georgia. In some sections of the far South the Kinnard also is relatively satisfactory.

MISSISSIPPI.

Distribution.—While a few apple trees occur in many parts of Mississippi, particularly in the northern part of the State, the interests are hardly to be rated as commercial, except as the orchards may supply a little fruit for local markets. Prentiss, Lee, and Pontotoc Counties (all in the northeastern part of the State) have been mentioned as having apple orchards of some extent.

Varieties.—The varieties named under "Alabama" are suggested also for the corresponding sections of Mississippi.

WEST SOUTH-CENTRAL STATES.

ARKANSAS.

Distribution.—The St. Louis, Iron Mountain & Southern Railway, which from the north enters Arkansas near the northeastern corner of the State and passes in a southwesterly direction to Texarkana, which is near the southwestern corner, divides the State in a general way into two approximately equal sections. The portion of the State lying west of the railroad named produces practically all of the apples grown in Arkansas. While they are distributed to a limited extent in the southeastern section, the quantity produced there is negligible. In the northwestern section there are a good many orchards of commercial importance that are widely distributed. However, the apples which are a substantial factor in the trade are produced in five or six counties in the northwestern corner, these counties being Benton, Washington, Carroll, Madison, and Boone. Other counties in the same section of the State which are of secondary importance in apple production are Crawford, Franklin, and Searcy. The commercial orchards which occur in other counties in the northwestern section of the State are more or less isolated and do not represent large unit interests.

Varieties.—A large number of varieties occur in the commercial orchards in Arkansas, but a very large proportion of the product consists of the following: Arkansas (*Mammoth Black Twig*), Ben Davis, Gano, Grimes, Jonathan, Maiden Blush, and Winesap. In the younger orchards Stayman Winesap is an important variety, but it has not yet been marketed in large quantities from this State.

LOUISIANA.

Distribution.—A few apples are grown for home use in the northern portion of Louisiana. From a commercial standpoint the quantity of fruit produced is negligible.

Varieties.—No special recommendations are made as to varieties aside from those under "Alabama" for locations other than those having relatively high elevations.

OKLAHOMA.

Distribution.—While there are a good many commercial apple orchards in Oklahoma they are rather widely distributed, with no very large centralization of the industry at any one point. With the State divided in a general way into eastern, central, and western thirds, the most of the commercial orchards occur in the central third of the State. Some fairly representative localities in which apples are grown to some extent commercially are Ada in Pontotoc County, Konawa in Seminole County, Guthrie in Logan County, and Enid in Garfield County. The fruit from some of these orchards, as well as from those located in other parts of the State which are somewhat isolated, is sold very largely in local markets.

Varieties.—As in many other States, a large number of varieties have been planted in Oklahoma, but the really important sorts consist of a comparatively small number, as follows: Arkansas (*Mammoth Black Twig*), Arkansas Black, Ben Davis, Gano, Grimes, Jonathan, Maiden Blush, Missouri, Red June, Stayman Winesap, Winesap, Yellow Transparent, and York Imperial.

In the south-central part of the State where the summers are long and usually very hot it is believed that the varieties suggested for the lower elevations in Alabama could be planted with more satisfaction than many of those which now comprise the orchards in that part of the State.

TEXAS.

Distribution.—Apples are relatively unimportant in Texas, though they are more or less widely distributed in the northern third of the State. This includes in a general way that part of Texas which lies north of a line extending from the southeastern corner of New Mexico due east to about the central portion of the State, then somewhat northeasterly to Marion County in the northeastern part of the State. In the section thus indicated there are no large areas devoted to commercial apple production, though a good many orchards of commercial size occur. These are reported to be somewhat centralized in Erath and Eastland Counties, in northern Comanche County, in the southern portion of the first northern tier of counties, and in the northern portion of the second tier of counties in the northeastern part of the State. This territory extends in a general way from Red River County in the east as far westward, possibly, as Baylor County. In the panhandle region interests of some importance have been developed in Hale and Lubbock Counties. In the extreme western part of the State, a section which includes the northern part of Brewster County, the western portion of Pecos County, and eastern part of Jeff Davis County should be mentioned in this connection. Apples are also grown to a limited extent in the region of El Paso.

Varieties.—Various lists of varieties have been suggested for different parts of Texas, but there is considerable similarity in them. Some of the more comprehensive lists include a number of varieties not often grown in other States. For northern Texas the following varieties have been recommended: Arkansas (*Mammoth Black Twig*), Arkansas Black, Becker, Bledsoe, Early Harvest, Gano, Jonathan, Kinnard, Lincoln, Missouri, San Jacinto, Stayman Winesap, and Summer Queen.

Other lists for this section of Texas include, in addition to the above, Ben Davis, Doyle, Maiden Blush, Red June, Yellow Transparent, and others. It may be stated also that the lists that have been recommended for other sections of the State consist very largely of different combinations of the varieties named above.

MOUNTAIN STATES.

In the Mountain States, commercial fruit growing is confined very largely to rather restricted areas in the valleys so located that they can be irrigated. Very few of the commercial orchards in the States in this division are maintained without irrigation.

MONTANA.

In Montana there are at the present time six fairly well defined valley areas where apples are grown, as follows:

(1) The Bitter Root Valley in Ravalli County and Southern Missoula County, the fruit district extending from Darby to Missoula.

(2) The Flathead Lake district in the southern part of Flathead County, the orchards being located largely on the shores of the lake and extending northward to Kalispell.

(3) The Kootenai Valley in Lincoln County, this valley area extending from Eureka in the north nearly to the border line of the State on the west.

(4) The Clark Fork valley in Sanders County between Plains and Thompson.

(5) The valley of the Clark Fork of the Yellowstone River in Carbon County from Fromberg to the junction of the fork with the Yellowstone.

(6) The Yellowstone River valley in Yellowstone County, centering about Billings.

Varieties.—A smaller number of varieties have been planted in the orchards in Montana than is the case in most commercial apple-growing regions. In the areas designated as Nos. 1, 2, 3, and 4, McIntosh, Rome Beauty, and Wealthy are the principal varieties. To a lesser extent, Delicious, and Wagener are planted. In area 2 Tompkins King is also grown. In areas 5 and 6 Gano, McIntosh, and Wealthy are chiefly grown.

IDAHO.

Distribution.—At the present time the most important apple-orchard interests of Idaho are located in the southwestern part of

the State. There are several important centers of production, as follows:

District 1.—Northern Idaho, which includes two sections, one centering about Bonners Ferry in the extreme northern part of the State and the other about Post Falls in the northern portion of Kootenai County.

District 2.—The Palouse region in Latah County, which extends also into Whitman County in eastern Washington.

District 3.—The Lewiston region, in Nez Perce County and also in the Snake River valley.

District 4.—The Council Valley, extending between Council and Weiser.

District 5.—The Payette Valley, centering about Payette and Emmett.

District 6.—The Boise Valley, with centers of production about Caldwell, Nampa, and Boise.

District 7.—The Snake River canyon region, which includes that portion of the Snake River valley which lies between the point where the river crosses the State line into Oregon and the Twin Falls region, where, at various points in the coves made by the river, orchards of some importance have been planted.

District 8.—The Snake River valley, in the Twin Falls region in the south-central part of the State.

District 9.—The Blackfoot and Idaho Falls region in the Snake River valley, in the southeastern part of the State.

Varieties.—The varieties in the following list, with numbers corresponding to those used to designate the several districts, include the more important sorts:[1]

District 1.—Banana (*Winter Banana*), Jonathan, Rome Beauty, Tompkins King, and Wagener.

District 2.—Jonathan, Grimes, Rome Beauty, and Wagener.

District 3.—Delicious, Esopus (*Spitzenberg*), Jonathan, Rome Beauty, Winesap, and Yellow Newtown.

Districts 4, 5, and 6.—Arkansas Black, Ben Davis, Delicious, Gano, Jonathan, Rome Beauty, and Winesap.

District 7.—Delicious, Gano, Jonathan, Rome Beauty, and Winesap.

District 8.—Delicious, Grimes, Jonathan, Rome Beauty, Stayman Winesap, Wagener, and Winesap.

District 9.—Gravenstein, McIntosh, and Wealthy.

A considerable number of other varieties are mentioned in Bulletin 83 of the Idaho experiment station[1] as being of secondary importance in each of the districts. For the northern districts the principal secondary varieties are Baldwin, Gravenstein, Grimes, Northern Spy, Oldenburg, Wolf River, Yellow Bellflower, and Yellow Transparent. For the other districts, the following comprise the principal secondary varieties where not named in the lists of first importance: Banana, Early Harvest, Gravenstein, McIntosh, Oldenburg, Rhode Island Greening, Stayman Winesap, White Pearmain, and Wealthy.

[1] The varieties here listed for the various districts are substantially those recommended by the Idaho Agricultural Experiment Station. (Vincent, C. C., and Downing, G. J., Recommended varieties of fruit for Idaho. Idaho Agr. Exp. Sta. Bul. 83, 14 p., map. 1915.)

The following varieties comprise the principal ones grown in the State on the basis of the relative quantity of each in the average crop for all the districts: Ben Davis, Jonathan, Tompkins King, Rome Beauty, and Winesap. (See p. 7.)

WYOMING.

Distribution.—As yet practically no commercial fruit growing has been developed in Wyoming. In a few sections where apples are grown the fruit is sold in local markets, but elsewhere the fruit is produced only in small ranch orchards for home use. The most important apple-orchard interests are located in the valley of the Bighorn River and its tributaries in Bighorn, Washakie, and Hot Springs Counties; also in the valley of the Platte River in Natrona, Converse, Platte, and Goshen Counties. Orchards more or less widely separated also occur in Crook, Johnson, and Sheridan Counties in the northeastern portion of the State.

Varieties.—Because of the rather adverse climatic conditions, only the more hardy varieties succeed. Those most planted are Longfield, Northwestern, Wealthy, and Wolf River. Doubtless other hardy varieties named under South Dakota and also for the northern sections of Minnesota and Wisconsin could be grown with some degree of success.

COLORADO.

Distribution.—There are several well-defined valleys or areas in Colorado where apples are of large commercial importance, as follows:

(1) The northern district includes the eastern portion of Larimer and Boulder Counties, the northeastern portion of Jefferson County, the western portion of Arapahoe and Adams Counties, and the southwestern portion of Weld County.

(2) The southeastern district is located in the Arkansas River valley and extends, with some breaks in the continuity of the orchards, from the Canon City section in Fremont County nearly to the eastern border of the State, although comparatively few orchards of importance have been planted east of Otero and Crowley Counties.

(3) The southwestern district may be said to consist of two sections, one of which is in the northeastern portion of Montezuma County and the other in the central and northern portion of La Plata County, extending somewhat into San Juan County.

(4) The west-central district consists of the Grand Valley (extending from Palisades to Fruita), the Uncompahgre Valley (extending from Delta and adjacent sections to Montrose), and the valley of the North Fork of the Gunnison, with important centers of production at Paonia and Hotchkiss.

There are other points in the valley of the Grand River above Palisades where apples are grown to some extent, Grand Valley, Rifle, and Antlers being representative points where there are

orchards of commercial standing. Aside from these disticts, where the commercial apple interests are large, the fruit is grown for home use in other parts of the State, though where water for irrigation is not available the conditions do not admit of commercial activities except in special instances.

Varieties.—The varieties suggested for the several commercial districts mentioned are as follows:

Northern district.—Ben Davis, Gano, Jonathan, Ralls (*Jeniton*), and Sheriff.

Southeastern district.—Maiden Blush, Jeffery, Jonathan, White Pearmain, and Winesap.

Southwestern district.—Delicious, Jonathan, White Pearmain, and Winesap.

West-central district.—Arkansas (*Mammoth Black Twig*), Arkansas Black, Ben Davis, Delicious, Gano, Jonathan, Rome Beauty, Stayman Winesap, and Winesap.

The leading varieties for the entire State, as indicated by the proportion of each in the average crop, are as follows: Ben Davis, Jonathan, Gano, Rome Beauty, and Winesap. (See under "Colorado" in connection with Table III.)

NEW MEXICO.

Distribution.—The commercial production of apples in New Mexico is limited to certain irrigated valleys. These districts have been clearly defined by Garcia, of the New Mexico Agricultural Experiment Station, in Bulletin 75.[1] In this bulletin, 10 valleys and sections of valleys in which apples are grown commercially are recognized. Since the bulletin was published in 1910, some of these districts have been extended more or less, and a new district has been developed in the vicinity of Portales, the county seat of Roosevelt County, in the east-central part of the State. The districts recognized are designated as follows:

(1) Mimbres Valley district, located in the eastern portion of Grant County and the central portion of Luna County in the southwestern corner of the State.

(2) Rio Grande Valley district, the largest one recognized, extending from the southern border of the State, in Dona Ana County, to Santa Fe County, in the north-central part of the State.

(3) The Otero County district, in the northern portion of Otero County, in the south-central part of the State.

(4) The Lincoln County district, in the southeastern section of Lincoln County.

(5) Pecos Valley district, extending from Roswell (in Chaves County) to Carlsbad (in Eddy County) in the southeastern corner of the State.

(6) The Colfax County district, in the central portion of Colfax County, in the northeastern part of the State.

(7) The San Miguel district, in the northwestern corner of San Miguel County.

[1] Garcia, Fabian. Apple culture under irrigation. N. Mex. Agr. Exp. Sta. Bul. 75. 44 p., 14 fig. 1910.

(8) The Santa Fe and Rio Arriba district, in the northern portion of Santa Fe County and the southeastern portion of Rio Arriba County.

(9) The Taos County district, in the central part of Taos County, in the north-central part of the State.

(10) The San Juan County district, in the San Juan River valley, in the northern part of San Juan County, in the northwestern corner of the State.

(11) The Roosevelt County district in the east-central part of the State, which, as already indicated, centers about Portales.

Varieties.—In districts 1, 2, 5, and 11: Arkansas (*Mammoth Black Twig*), Arkansas Black, Ben Davis, Gano (or *Black Ben*), Jonathan, Red June, Winesap, and Yellow Transparent. In districts 3, 4, 6, 7, 8, 9, and 10: Delicious, Gano (or *Black Ben*), Jonathan, Maiden Blush, Rome Beauty, Stayman Winesap, White Pearmain, Winesap, and Yellow Transparent.

ARIZONA.

Distribution.—While apple orchards occur in various portions of Arizona, the principal districts in which they are of commercial importance are in the valley of the Gila River, in Graham County (in the southeastern portion of the State), and in the valley of the Verde River, in the eastern portion of Yavapai County (in the center of the State).

Varieties.—In the Gila Valley: Arkansas Black, Ben Davis, Gano (or *Black Ben*), and Stayman Winesap. In the Verde Valley: The varieties named above; also Jonathan and White Pearmain.

UTAH.

Distribution.—Commercial apple growing in Utah is confined principally to three irrigated valleys in northern portions of the State. In the northeastern part, in the Cache Valley, along the western slope of the Wasatch Mountains, many apples are grown; also in the valleys lying north of Great Salt Lake, in the eastern portion of Box Elder County. A third valley is in Davis County, between Great Salt Lake and the western slope of the Wasatch Mountains. This valley is practically a continuation of the Cache Valley. In some of the small irrigated valleys in other sections of Utah minor apple interests have been developed, but they are not of special importance commercially.

Varieties.—The varieties grown principally are Ben Davis, Gano, Jonathan, Rome Beauty, and Winesap. In some sections the Ben Davis and Gano (or *Black Ben*) are now much less prominent than they were formerly.

NEVADA.

Distribution.—A few apples are grown in some sections of Nevada for home use, but there is no commercial apple industry in this State at the present time.

PACIFIC STATES.

WASHINGTON.

Distribution.—The principal commercial apple interests in Washington are located in irrigated valleys east of the Cascade Mountains, the principal centers of which are the following:

(1) The Yakima Valley, in Yakima County and the western part of Benton County.

(2) The Wenatchee Valley, extending in Chelan County from Peshastin to Wenatchee and bordering on the Columbia River to Malaga.

(3) The area about the junction of the Columbia and Snake Rivers, which form the boundaries between Walla Walla, Franklin, and Benton Counties.

(4) The Walla Walla Valley, in the vicinity of Walla Walla.

(5) The Snake River valley, along the borders of Garfield, Columbia, and Whitman Counties.

(6) The Clarkston district, in the northern portion of Asotin County, which with the Lewiston district in Idaho comprises the Lewiston-Clarkston district, as it is commonly called.

(7) The Palouse district, in the eastern part of Whitman County, which, together with a corresponding section in Latah County, Idaho, comprise a more or less important district.

(8) The Spokane district, which comprises an area that includes the Post Falls district in Idaho, the northern portion of Spokane County, the southern part of Pend Oreille County, and the southwestern portion of Stevens County.

(9) The Columbia River valley, in the northern portion of Stevens and Ferry Counties.

(10) The Okanogan Valley, in Okanogan County.

(11) The Lake Chelan district, which may also be made to include certain points in the Columbia River valley where it is the boundary between Douglas and Chelan Counties between Lake Chelan and Wenatchee.

(12) The White Salmon district, in the southwestern part of Klickitat County.

(13) The Puget Sound region, where apples are grown in the aggregate in quite large quantities, but do not constitute an industry of the same commercial purport as do the interests in the larger valleys east of the mountains.

Varieties.—The principal varieties produced in most of the commercial areas are Arkansas, Arkansas Black, Ben Davis, Banana, Delicious, Esopus (*Spitzenberg*), Gano, Grimes, Jonathan, Rome Beauty, Stayman Winesap, White Pearmain, Winesap, and Yellow Newtown. In the Puget Sound district, Baldwin, Gravenstein, Northern Spy, Rhode Island Greening, Tompkins King, and various other varieties commonly occur. The Esopus (*Spitzenberg*) and Yellow Newtown are grown only to a limited extent, and are unimportant varieties in most of the districts in Washington.

OREGON.

Distribution.—The fruit districts of Oregon are fairly definitely delimited. With slight exceptions they are confined to certain irrigated valleys as follows:

East of the Cascade Range.—(1) The Grande Ronde Valley, in the central part of Union County; (2) the Walla Walla Valley, in the Milton-Freewater sec-

tion in Umatilla County; (3) the Hood River valley, in Hood River County, including the Mosier Valley in the northwestern corner of Wasco County; (4)

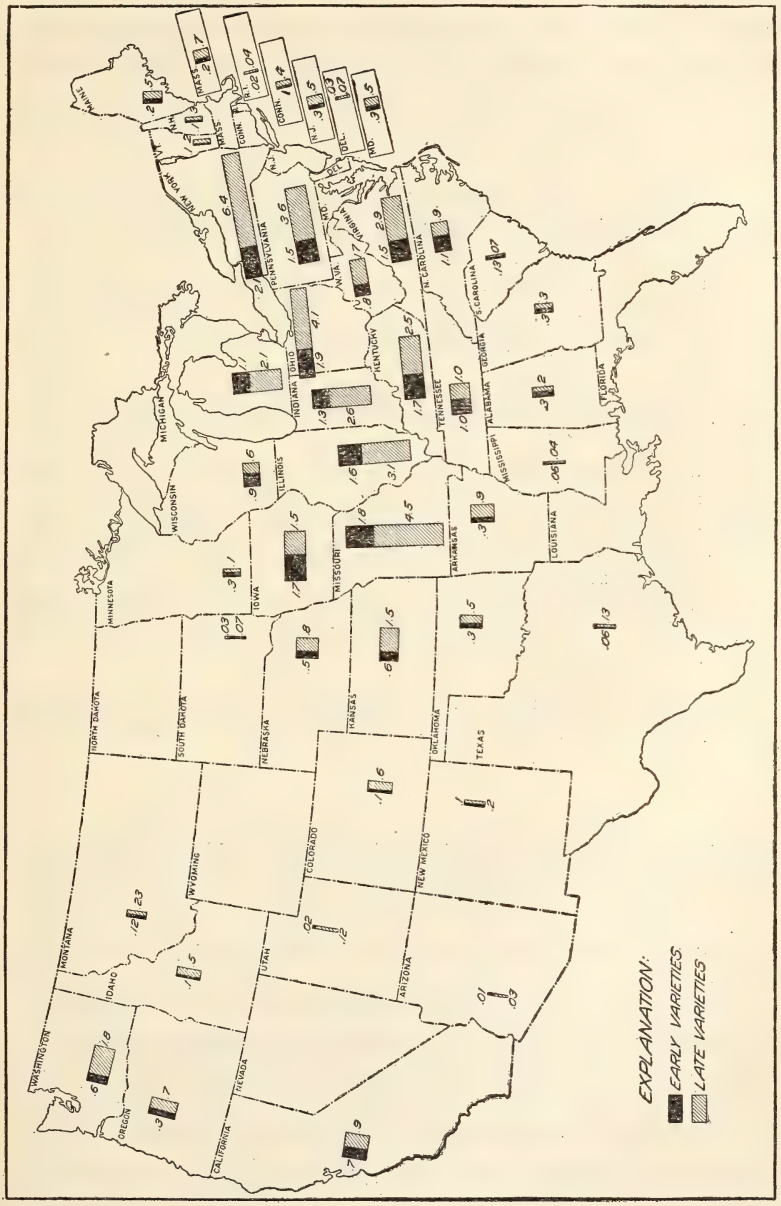


FIG. 11.—Outline map of the United States, showing the estimated relative production of early and late varieties in each State in 1915. The black portion of the bars represents early varieties; the crosshatched portion, late varieties. The figures represent the estimated number of barrels on the basis of 1,000,000.

The Dalles section, also in Wasco County, a section relatively unimportant so far as apples are concerned, the stone fruits comprising most of the fruit industry.

West of the Cascade Range.—(5) The Willamette Valley; (6) the Umpqua Valley, in the central part of Douglas County; (7) the Rogue River valley, in the eastern part of Josephine County and the central part of Jackson County.

Varieties.—There is more or less uniformity in the important varieties in the different valleys. However, the leading ones in some sections are unimportant in others. The following lists are based largely on recommendations of the Oregon Agricultural Experiment Station:[1]

District 1.—Ben Davis, Gano, Rome Beauty, Tompkins King, Wagener, and York Imperial; some Banana and Delicious in the younger orchards.

District 2.—Jonathan, Rome Beauty, and Winesap; in older orchards, Ben Davis also, but the trees are being top-worked more or less to other varieties.

District 3.—Esopus (*Spitzenberg*) and Yellow Newtown are most important; Arkansas Black, Jonathan, Monmouth (*Red Cheek*), and others occur to some extent.

District 4.—The few apples grown in this section (The Dalles) consist largely of the Baldwin, Ben Davis, Esopus (*Spitzenberg*), Winesap, and Yellow Newtown.

District 5.—On account of its size and the varied conditions in this valley (Willamette) a rather wide range of varieties is grown, the pricipal ones being Baldwin, Esopus (*Spitzenberg*), Gano, Gravenstein, Grimes, Jonathan, Northern Spy, Ortley, Rhode Island Greening, Rome Beauty, Tompkins King (sometimes watercores badly), and Wagener.

Districts 6 and 7.—Esopus and Yellow Newtown are the most important; Jonathan (in district 6) and Jonathan and Winesap (in district 7) also occur to some extent.

The percentage of each of the different varieties in the normal commercial crop for the entire State is indicated in connection with Table III.

CALIFORNIA.

Distribution.—Apple growing in California is widely distributed. From 100 to 500 acres or more of bearing trees occur in nearly every county in the State, but a very large proportion of the commercial crop is produced in two or three sections. The Pajaro Valley, which includes the southern part of Santa Cruz County and the northern part of Monterey County, perhaps more commonly called the Watsonville district, is the most important apple-growing section in California, the two counties named producing nearly 65 per cent of the entire crop of the State. The Sebastopol section of Sonoma County is the second largest district, that county producing about 16 per cent of the normal crop of the State. The other counties, each of which produces 2 per cent[2] or more of the normal crop of

[1] Lewis, C. I. Orchard management. Oreg. Agr. Exp. Sta. Bul. 111, 96 p., 41 fig. 1911.

[2] Estimates of the Office of the California State Commissioner of Horticulture.

the entire State, are San Bernardino (4 per cent), Nevada (3 per cent), and Los Angeles and Humboldt (each 2 per cent). The production in each of the counties not named in the present connection is less than 2 per cent of a normal crop of the State. Recent plantings in San Diego, San Bernardino, and Riverside Counties doubtless will increase materially the apple production in these counties within the next few years.

Varieties.—A large proportion of the commercial apple crop of California is made up of three varieties, Yellow Bellflower and Yellow Newtown, grown in the Pajaro Valley, and the Gravenstein,

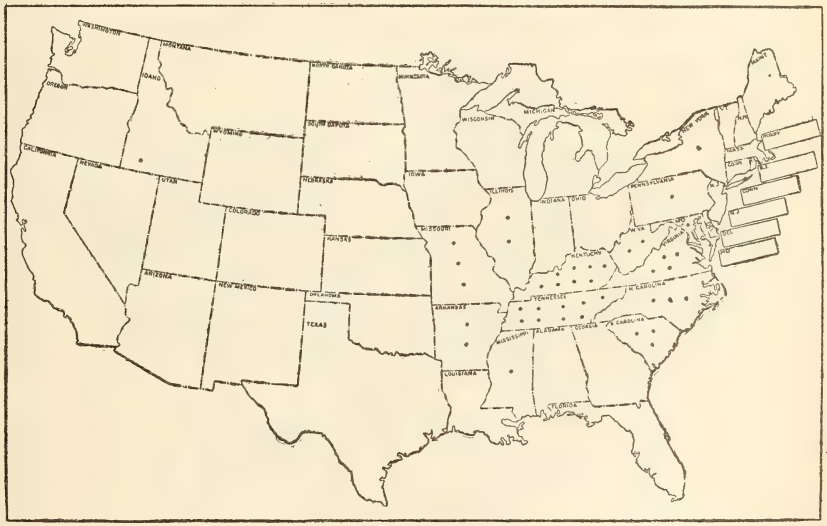


FIG. 12.—Outline map of the United States, showing the distribution by States of that portion of the estimated average apple crop for the years 1909 to 1913, inclusive, which is harvested in June. Each dot represents 30,000 bushels. The arrangement of the dots within the State boundaries has no significance.

which characterizes the output from the Sebastopol section of Sonoma County.

Perhaps no more comprehensive index of the regional value of varieties can be given than the summary of the responses made by apple growers to a request issued by the Office of the California State Commissioner of Horticulture for information in regard to what were the leading sorts, which is substantially as follows:

It is interesting to note in connection with first choice of varieties in answer to question No. 12 [Name your leading varieties in the order of their impor-

[1] Weldon, George P. Apple growing in California . . . p. 124 [Sacramento], 1914. Issued by the California State Commission of Horticulture.

tance] that one man, reporting from Butte County, places Black Ben first. Four reporting from El Dorado (no two agreeing) gave Rome Beauty, Esopus, Baldwin, and Sutton. One man from Fresno reports Fameuse as his first choice. Humboldt County is represented by six growers, giving Wagener, Tompkins King, Esopus, and Yellow Bellflower; two favored Rhode Island Greening. Two reports from Madera County were received, both giving White Pearmain as the leading variety for that section. In Mendocino County the following varieties are said to be the best by four who answered the questions: Jonathan, Swaar, Tompkins King, and Baldwin. One report from Monterey County places the Yellow Newtown first. Eleven orchardists reported from Riverside County, giving a leading place to the following: King David, Esopus, Rhode Island Greening; three favored Rome Beauty and five Delicious. Eight orchardists were heard from in San Bernardino County, one giving the Jonathan first

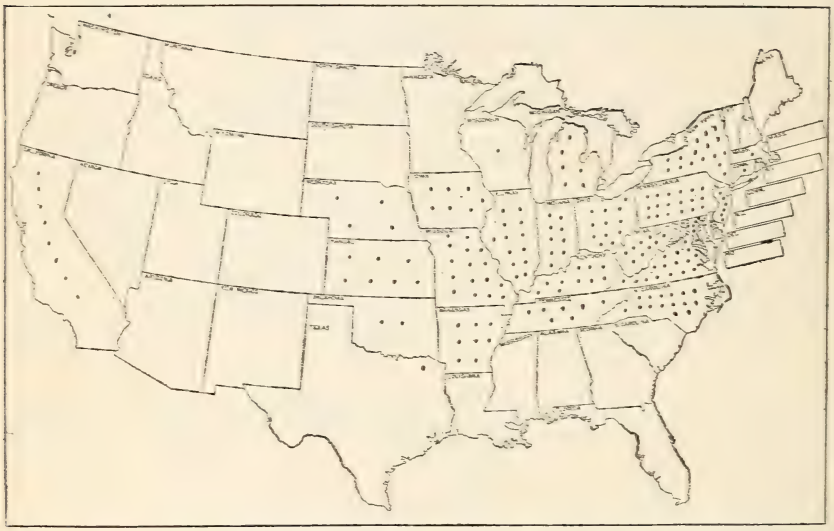


FIG. 13.—Outline map of the United States, showing the distribution by States of that portion of the estimated average apple crop for the years 1909 to 1913, inclusive, which is harvested in July. Each dot represents 30,000 bushels. The arrangement of the dots within the State boundaries has no significance.

place, two Winesap, and five Rome Beauty. From San Diego County nine reports came, one giving Jonathan as the leading variety, one Julian Duchess, one Paragon, three Yellow Newtown, and three Yellow Bellflower. As would naturally be expected, only two varieties were given first place by nine of the leading orchardists reporting from Santa Cruz County; six favored the Yellow Newtown and three the Yellow Bellflower.

The second county in importance from the standpoint of production, viz, Sonoma, is represented in these answers by eleven growers, eight of whom favor the Gravenstein, one the Alexander, one the Rome Beauty, and one the Yellow Newtown. One report from Tehama County gives the Yellow Newtown first place.

The replies to the above-mentioned request for lists of the leading sorts in the different sections mentioned in all some 48 different

varieties, of which the following 20, listed alphabetically, are given prominence in the bulletin already cited, because of their relative importance in the apple industry of the State:

ARKANSAS (*Mammoth Black Twig*).—Grown only to a limited extent, but has some very desirable characteristics.

ARKANSAS BLACK.—Rather popular in some parts of southern California.

BALDWIN.—Does quite well in a few favored localities in the mountains. Quite a large acreage has been planted in Sonoma County.

BANANA (*Winter Banana*).—Usually does best at rather high altitudes, though excellent specimens have been grown in Santa Cruz County.

BLACK BEN.—This variety, or Gano, is suggested for planting instead of Ben Davis, which at present constitutes nearly 4 per cent of the entire crop of the State.

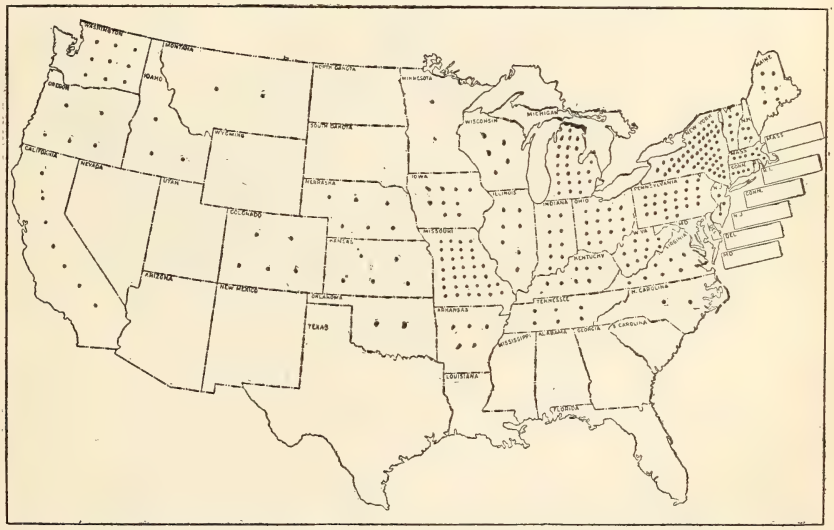


FIG. 14.—Outline map of the United States, showing the distribution by States of that portion of the estimated average apple crop for the years 1909 to 1913, inclusive, which is harvested in August. Each dot represents 30,000 bushels. The arrangement of the dots within the State boundaries has no significance.

DELICIOUS.—Not yet fully tested, but considered promising in certain parts of the foothills and mountainous sections of southern California.

ESOPUS.—Not generally grown, but recommended by some for a few localities.

GRAVENSTEIN.—Does well in many parts of the State, but is of special importance in the Sebastopol section.

GRIMES.—Occurs only occasionally, but as a rule it gives good results wherever grown.

JONATHAN.—Not generally grown, but reported to do well in places in Riverside, San Bernardino, San Diego, El Dorado, Mendocino, and Humboldt Counties.

KING DAVID.—Not fully tested, but considerably planted in some of the younger orchards in Riverside and San Bernardino Counties.

Mammoth Black Twig.—See ARKANSAS.

ORTLEY—Especially mentioned for the foothill sections in Placer and Mariposa Counties.

RHODE ISLAND GREENING.—Especially mentioned for Humboldt and San Diego Counties—the extreme northern and southern parts of the State.

ROME BEAUTY.—Planted more or less widely. Reported to do especially well in the Yucaipa section of San Bernardino County.

Spitzenberg.—See ESOPUS.

STAYMAN WINESAP.—Not yet extensively grown, but considered very promising for the apple sections of San Bernardino, Riverside, and Tehama Counties.

WAGENER.—Reported to do well in sections of Humboldt, Mendocino, Sonoma, and Napa Counties.

WHITE PEARMAIN (*Winter Pearmain*).—Occurs quite generally in the older orchards in many parts of the State where it habitually does well. It is

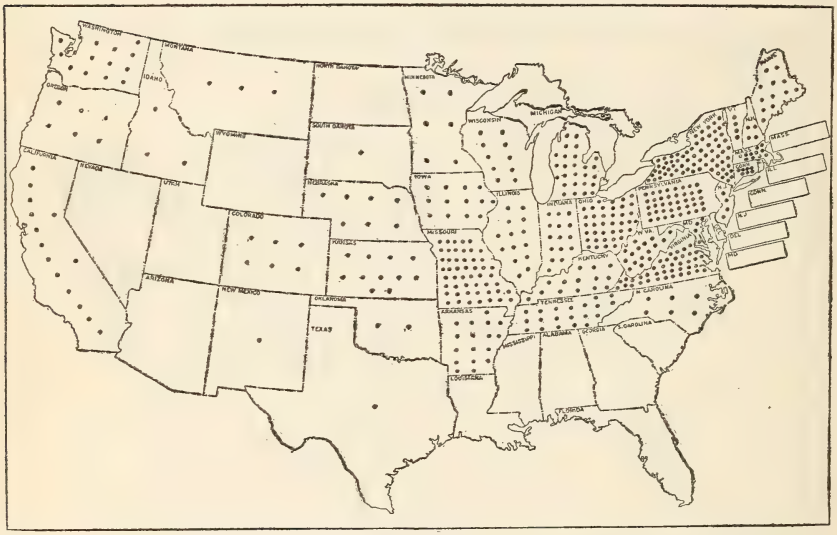


FIG. 15.—Outline map of the United States, showing the distribution by States of that portion of the estimated average apple crop for the years 1909 to 1913, inclusive, which is harvested in September. Each dot represents 30,000 bushels. The arrangement of the dots within the State boundaries has no significance.

especially mentioned for the mountainous sections of Madera, San Bernardino, and San Diego Counties; also does well in the Pajaro and Santa Clara Valleys.

WINESAP.—Quite extensively planted in the foothills; it is widely distributed in the older orchards in many sections of the State.

Winter Banana.—See BANANA.

YELLOW BELLFLOWER.—Of special value in the Watsonville district where, with the Yellow Newtown, it very largely forms the basis of the apple industry of that section, but is planted more or less widely in many parts of the State.

YELLOW NEWTOWN.—The comments under the preceding variety also apply to the Yellow Newtown. Aside from the Watsonville section, it is also especially mentioned for planting in Humboldt and Lassen Counties in the northern part and in San Diego, Riverside, and San Bernardino Counties in the southern part of the State.

ESTIMATED RELATIVE PROPORTION OF EARLY AND LATE APPLES IN DIFFERENT STATES.

The proportionate quantity of early and late varieties in the different States and the millions of barrels of each in 1915 are shown in figure 11. The designations early and late are based on varieties, those which have normally a short period of use being grouped as early and the varieties that are commonly stored or possess naturally long-keeping quality as late. The numerals shown on the map in figure 11 are listed in Table V.

The accompanying maps, designated as figures 12, 13, 14, 15, and 16, indicate the estimated quantity of apples in the average crops for

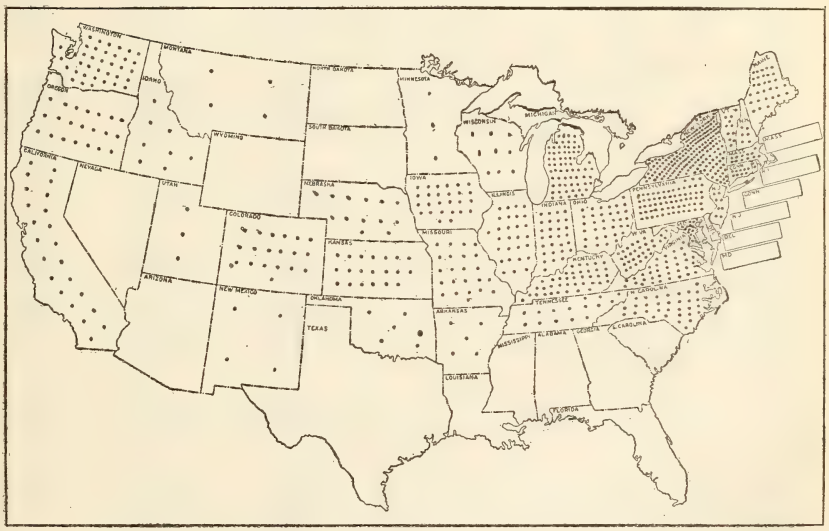


FIG. 16.—Outline map of the United States, showing the distribution by States of that portion of the estimated average apple crop for the years 1909 to 1913, inclusive, which is harvested in October and later. Each dot represents 30,000 bushels. The arrangement of the dots within the State boundaries has no significance.

1909 to 1913 inclusive, harvested, respectively, in June, July, August, September, and October, figure 16 showing also the fruit picked later than October. In a general way, these maps also indicate geographically the sections of country from which the crop is ready for consumption or market in the several months covered by the harvest period. It should be stated in this connection that the data which form the basis of these maps are not entirely comprehensive, but it is believed that this regional distribution of the harvesting of apples in the different months shown by these maps is suggestive as well as instructive.

TABLE V.—*Estimated production (in barrels) of early and of late varieties of apples in the United States, 1915.*

Divisions and States.	Early varieties.	Late varieties.	Total.
New England States:			
Maine	202,000	518,000	720,000
New Hampshire	74,000	279,000	353,000
Vermont	97,000	227,000	324,000
Massachusetts	204,000	681,000	885,000
Rhode Island	15,000	44,000	59,000
Connecticut	107,000	404,000	511,000
Middle Atlantic States:			
New York	2,132,000	6,396,000	8,528,000
New Jersey	326,000	451,000	777,000
Pennsylvania	1,525,000	3,560,000	5,085,000
South Atlantic States:			
Delaware	57,000	65,000	122,000
Maryland	264,000	536,000	800,000
Virginia	1,494,000	2,899,000	4,393,000
West Virginia	854,000	1,659,000	2,513,000
North Carolina	1,085,000	887,000	1,972,000
South Carolina	155,000	66,000	221,000
Georgia	313,000	312,000	625,000
Florida			
East North-Central States:			
Ohio	1,915,000	4,069,000	5,984,000
Indiana	1,320,000	2,563,000	3,883,000
Illinois	1,651,000	3,065,000	4,716,000
Michigan	1,039,000	2,111,000	3,150,000
Wisconsin	884,000	589,000	1,473,000
West North-Central States:			
Minnesota	272,000	140,000	412,000
Iowa	1,707,000	1,513,000	3,220,000
Missouri	1,760,000	4,527,000	6,287,000
North Dakota			
South Dakota	73,000	27,000	100,000
Nebraska	507,000	760,000	1,267,000
Kansas	637,000	1,488,000	2,125,000
East South-Central States:			
Kentucky	1,668,000	2,502,000	4,170,000
Tennessee	1,012,000	1,013,000	2,025,000
Alabama	319,000	213,000	532,000
Mississippi	99,000	42,000	141,000
West South-Central States:			
Louisiana			
Texas	56,000	131,000	187,000
Oklahoma	242,000	538,000	780,000
Arkansas	296,000	887,000	1,183,000
Mountain States:			
Montana	121,000	226,000	347,000
Wyoming			
Colorado	118,000	575,000	693,000
New Mexico	49,000	224,000	273,000
Arizona	12,000	28,000	40,000
Utah	35,000	107,000	142,000
Nevada	12,000	28,000	40,000
Idaho	86,000	487,000	573,000
Pacific States:			
Washington	608,000	1,825,000	2,433,000
Oregon	303,000	740,000	1,043,000
California	625,000	938,000	1,563,000
United States	26,330,000	50,340,000	76,670,000

ESTIMATED ANNUAL PRODUCTION, 1890 TO 1916.

The estimated total annual production of apples for the entire country from 1890 to 1916, inclusive, based on the Eleventh (1889), Twelfth (1900), and the Thirteenth (1910) Census reports, and upon reports from correspondents of the Bureau of Crop Estimates, is given in Table VI.

TABLE VI.—*Estimated annual production (in barrels) of apples in the United States, 1890 to 1916, inclusive.*[1]

[In thousands; i. e., 000 omitted.]

Divisions and States.	1889 census.	1890	1891	1892	1893	1894	1895	1896	1897	1898
North Atlantic States:										
Maine	1,024	675	1,230	1,245	525	1,485	480	1,830	225	735
New Hampshire	761	507	1,187	1,231	502	1,410	434	1,904	467	1,425
Vermont	404	408	793	725	594	874	532	1,003	484	656
Massachusetts	563	342	1,190	1,150	680	1,833	846	2,541	680	1,200
Rhode Island	80	23	118	82	61	93	80	147	38	63
Connecticut	665	222	1,209	752	725	1,089	1,312	1,500	753	1,063
New York	2,831	2,687	9,803	8,149	5,713	8,172	8,493	18,059	6,557	4,385
New Jersey	201	170	957	615	747	798	1,322	792	762	440
Pennsylvania	2,518	1,017	6,930	4,492	4,730	4,715	5,225	8,841	4,680	4,875
Total	9,047	6,051	23,417	18,441	14,276	20,469	18,724	36,616	14,645	14,842
South Atlantic States:										
Delaware	37	25	153	34	112	30	206	42	100	40
Maryland	471	245	983	306	816	198	923	224	791	402
Virginia	2,797	1,419	4,213	1,812	4,213	850	4,860	1,393	4,667	1,890
West Virginia	1,480	374	2,415	1,027	1,260	404	3,013	1,710	2,218	720
North Carolina	2,531	1,280	2,400	1,890	2,457	532	3,530	1,353	2,517	2,728
South Carolina	145	93	150	147	152	34	159	86	143	134
Georgia	704	303	506	530	383	138	545	255	367	273
Florida	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	8,165	3,739	10,820	5,746	9,393	2,186	13,236	5,063	10,802	6,186
East North-Central States:										
Ohio	4,596	1,300	5,219	262	963	3,597	8,239	6,593	2,552	1,420
Indiana	2,928	1,111	3,198	889	393	1,350	4,263	2,603	1,947	500
Illinois	3,200	1,386	2,882	880	483	2,128	3,897	3,717	4,674	1,239
Michigan	4,385	2,639	2,788	2,733	2,403	4,347	1,803	7,663	1,260	3,939
Wisconsin	531	354	403	356	274	375	146	508	155	474
Total	15,640	6,790	14,490	5,120	4,516	11,797	18,347	21,085	10,588	7,572
West North-Central States:										
Minnesota	27	33	35	40	39	41	34	74	51	89
Iowa	1,680	1,265	1,856	1,017	640	1,452	1,283	2,239	1,849	922
Missouri	2,899	2,420	3,220	1,381	936	2,569	4,816	3,780	3,509	784
North Dakota	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Dakota	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nebraska	391	283	567	194	254	355	576	686	837	428
Kansas	1,238	1,200	2,080	583	475	1,760	1,757	1,530	1,615	667
Total	6,235	5,201	7,758	3,215	2,345	6,177	8,466	8,309	7,862	2,889
South-Central States:										
Kentucky	3,560	1,125	3,634	2,350	1,440	588	5,400	2,091	2,444	1,696
Tennessee	2,428	1,606	2,743	2,283	2,731	657	4,020	1,375	2,679	1,402
Alabama	413	212	353	462	313	181	501	159	389	386
Mississippi	202	50	152	161	129	96	199	151	132	120
Louisiana	39	.....	.....	.....	.....	.....	.....	.....	.....	.....
Texas	248	90	253	183	203	187	287	248	287	260
Oklahoma	.....	.....	.....	.....	.....	.....	.....	33	83	53
Arkansas	631	528	910	767	901	539	1,674	759	1,507	970
Total	7,521	3,611	8,045	6,206	5,716	2,247	12,082	4,816	7,522	4,887
Far Western States:										
Montana	2	.....	.....	.....	7	17	13	18	20	27
Wyoming	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Colorado	24	25	45	47	33	99	114	83	141	113
New Mexico	12	13	27	27	30	33	50	33	83	58
Arizona	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Utah	19	27	67	58	67	59	96	57	143	110
Nevada	10	10	10	7	3	7	7	7	7	7
Idaho	29	40	57	50	83	90	103	117	80	133
Washington	98	174	231	204	274	273	382	324	567	686
Oregon	346	448	540	368	544	527	569	238	747	742
California	552	585	797	690	970	902	1,011	768	1,370	1,100
Total	1,093	1,322	1,772	1,450	2,011	2,007	2,346	1,644	3,158	2,977
Grand total	47,702	26,714	66,302	40,179	38,258	44,883	73,200	77,533	54,576	39,354

[1] Monthly Crop Report, vol. 2, no. 10 (October, 1916), p. 103.

TABLE VI.—*Estimated annual production (in barrels) of apples, etc.*—Contd.

Divisions and States.	1899 census.	1900	1901	1902	1903	1904	1905	1906	1907	1908
North Atlantic States:										
Maine	474	1,667	850	1,260	1,390	1,867	933	1,267	1,650	600
New Hampshire	660	1,900	333	1,433	533	1,567	500	667	700	500
Vermont	392	1,267	567	1,000	517	1,300	567	733	700	733
Massachusetts	1,008	2,100	567	2,133	1,100	1,833	900	1,133	967	800
Rhode Island	113	133	33	167	67	100	100	100	67	67
Connecticut	1,236	1,267	367	1,567	667	967	800	833	733	333
New York	8,037	15,667	3,667	13,667	15,333	18,333	7,000	10,333	9,333	11,000
New Jersey	1,547	967	333	1,333	1,033	1,033	867	700	733	433
Pennsylvania	8,020	6,000	3,000	6,333	6,167	8,333	4,500	5,833	4,600	4,933
Total	21,487	30,967	9,717	28,893	26,807	35,333	16,167	21,600	19,483	19,400
South Atlantic States:										
Delaware	234	200	33	200	100	167	167	133	67	100
Maryland	1,050	900	633	667	900	700	933	667	667	733
Virginia	3,279	2,833	3,167	2,233	4,367	2,000	3,367	1,833	1,733	2,967
West Virginia	2,499	1,400	2,033	1,433	1,267	2,167	1,600	1,967	900	1,767
North Carolina	1,554	2,467	2,167	2,200	2,067	2,200	1,667	1,567	867	2,367
South Carolina	84	127	120	143	147	163	120	160	53	253
Georgia	224	300	233	333	367	400	233	433	167	500
Florida	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	8,925	8,227	8,387	7,210	9,213	7,797	8,087	6,760	4,453	8,687
East North-Central States:										
Ohio	6,872	4,600	3,500	4,233	4,500	4,667	1,600	5,333	1,333	2,000
Indiana	2,873	1,500	2,167	2,100	1,933	1,967	1,367	3,000	667	733
Illinois	3,059	2,500	1,967	3,367	1,700	2,000	1,500	4,033	533	867
Michigan	2,977	3,933	1,733	6,000	5,133	6,233	2,100	4,567	3,167	2,333
Wisconsin	101	500	200	600	467	800	433	733	567	533
Total	15,883	13,033	9,567	16,300	13,733	15,667	7,000	17,667	6,267	6,467
West North-Central States:										
Minnesota	40	133	83	133	200	217	233	200	300	167
Iowa	1,043	1,767	967	2,233	1,600	2,333	1,267	2,633	1,200	1,000
Missouri	2,165	2,767	3,500	3,900	2,067	3,233	2,100	6,667	433	2,033
North Dakota	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Dakota	6	13	17	20	33	47	40	57	50	30
Nebraska	448	600	567	1,033	467	933	533	1,300	300	600
Kansas	1,071	1,767	2,267	1,933	1,000	1,533	1,200	2,567	60	1,900
Total	4,774	7,047	7,400	9,253	5,367	8,297	5,373	13,423	2,343	5,730
South-Central States:										
Kentucky	2,018	2,133	2,767	1,567	2,367	2,333	1,900	3,033	1,000	1,333
Tennessee	1,796	2,167	2,433	1,533	2,133	1,767	1,133	2,367	533	1,800
Alabama	240	400	367	367	467	500	267	467	133	433
Mississippi	83	167	133	137	167	143	107	127	47	150
Louisiana	23	.....	.....	.....	.....	.....	.....	.....	.....	.....
Texas	197	267	167	200	167	200	233	167	100	133
Oklahoma	111	157	147	217	193	183	250	367	317	233
Arkansas	937	967	1,100	1,333	800	1,333	1,067	1,433	1,200	533
Total	5,405	6,257	7,113	5,353	6,293	6,460	4,957	7,960	3,330	4,617
Far Western States:										
Montana	15	33	27	60	73	87	103	120	147	170
Wyoming	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
Colorado	86	200	243	400	333	667	533	733	133	467
New Mexico	47	87	73	117	67	103	140	157	40	160
Arizona	4	3	7	7	3	7	17	13	13	23
Utah	63	133	83	100	127	157	140	143	73	127
Nevada	4	7	10	13	20	20	23	27	37	10
Idaho	75	167	83	170	157	217	167	203	233	253
Washington	243	650	623	767	867	900	833	1,000	1,267	1,067
Oregon	291	767	500	733	800	867	600	900	700	867
California	1,163	1,067	1,333	1,400	1,367	1,300	1,267	1,533	1,333	1,600
Total	1,991	3,113	2,983	3,767	3,813	4,323	3,823	4,830	3,977	4,747
Grand total	58,466	68,643	45,167	70,777	65,227	77,877	45,407	72,240	39,853	49,647

TABLE VI.—*Estimated annual production (in barrels) of apples, etc.*—Contd.

Divisions and States.	1909 census.	1910	1911	1912	1913	1914	1915	1916
North Atlantic States:								
Maine	1,212	1,183	2,267	1,800	1,000	2,467	720	1,680
New Hampshire	369	600	533	733	267	667	353	532
Vermont	487	900	750	867	233	1,067	324	1,104
Massachusetts	850	967	1,000	1,100	767	1,467	885	1,150
Rhode Island	71	100	133	100	100	133	59	87
Connecticut	514	600	800	567	700	833	511	610
New York	8,470	5,667	13,000	14,667	6,500	16,533	8,528	12,600
New Jersey	469	567	1,033	567	700	1,133	777	750
Pennsylvania	3,683	3,867	6,833	4,233	3,400	7,700	5,085	6,207
Total	16,124	14,450	26,350	24,633	13,667	32,000	17,242	24,720
South Atlantic States:								
Delaware	61	117	100	140	60	167	122	83
Maryland	608	900	867	883	433	1,167	800	848
Virginia	2,036	4,033	2,400	5,000	1,733	5,100	4,392	4,433
West Virginia	1,408	2,367	2,600	3,433	333	4,133	2,513	3,344
North Carolina	1,592	2,400	1,200	2,533	1,000	3,000	1,972	2,358
South Carolina	121	247	157	200	87	267	221	196
Georgia	299	467	267	467	300	667	625	541
Florida	1	.....	.....	.....	.....	.....	.....	.....
Total	6,125	10,530	7,590	12,657	3,947	14,500	10,645	11,803
East North-Central States:								
Ohio	1,555	1,967	6,233	3,533	1,600	4,433	5,984	2,867
Indiana	920	1,633	2,967	1,400	2,200	1,433	3,883	1,307
Illinois	1,031	267	3,533	1,933	2,733	1,233	4,716	1,616
Michigan	4,111	1,400	4,100	5,733	2,967	5,733	3,150	4,160
Wisconsin	744	133	1,000	667	1,333	733	1,473	878
Total	8,360	5,400	17,833	13,267	10,833	13,567	19,205	10,828
West North-Central States:								
Minnesota	348	50	433	233	600	233	412	422
Iowa	2,249	67	3,167	500	2,367	533	3,220	1,575
Missouri	3,323	2,533	3,867	6,400	2,633	4,167	6,287	2,700
North Dakota	1	.....	.....	.....	.....	.....	.....	.....
South Dakota	64	10	80	67	107	67	100	116
Nebraska	1,107	467	1,200	933	767	400	1,267	567
Kansas	452	2,200	800	2,233	900	1,033	2,125	1,040
Total	7,544	5,327	9,547	10,367	7,373	6,433	13,410	6,420
South-Central States:								
Kentucky	2,456	1,767	2,033	3,200	2,300	3,000	4,170	2,147
Tennessee	1,547	1,733	967	2,967	1,300	2,867	2,025	1,772
Alabama	296	333	233	400	300	533	532	380
Mississippi	89	110	80	150	123	167	141	116
Louisiana	11	.....	.....	.....	.....	.....	.....	.....
Texas	56	133	67	167	100	167	187	156
Oklahoma	247	400	350	567	367	500	780	275
Arkansas	765	900	1,000	1,700	1,333	1,667	1,183	1,018
Total	5,467	5,377	4,730	9,150	5,823	8,900	9,019	5,864
Far Western States:								
Montana	189	140	300	300	280	300	347	256
Wyoming	6	3	7	10	10	.....	.....	.....
Colorado	1,186	500	900	1,033	1,100	1,500	693	1,015
New Mexico	139	113	227	250	217	300	273	119
Arizona	24	33	37	43	30	32	40	46
Utah	117	137	153	227	203	267	142	33
Nevada	25	53	33	87	53	67	40	16
Idaho	220	417	400	550	467	567	573	147
Washington	891	1,933	1,167	2,567	2,300	2,767	2,433	3,225
Oregon	644	1,267	500	1,367	1,167	1,200	1,043	1,285
California	1,645	1,533	1,567	1,900	1,000	2,000	1,563	1,918
Total	5,085	6,130	5,290	8,333	6,827	9,000	7,148	8,060
Grand total	48,707	47,213	71,340	78,407	48,470	84,400	76,670	67,695

NOTE.—The part of this bulletin which treats of the important centers or areas of apple production and the varieties principally grown in them, from the nature of the case, must be more or less incomplete. Reference to areas of considerable commercial importance may have been omitted in some instances where conditions are such as to merit mention in the present connection. Where this has occurred it has been due to a lack of definite information concerning the importance of the areas. It is also likely that differences of opinion and experience will appear in regard to some of the lists of varieties named for the different districts.

In order that the information coming within the scope of this bulletin may be completed and made as valuable as is possible to the apple industry, the writers will appreciate any constructive suggestions that may be offered by fruit growers and others familiar with the conditions of apple production in different parts of the country.

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